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Framework Convention on Climate Change

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Report on the individual review of the annual submission of the European Union submitted in 2015*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol, with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2015 annual submission of the European Union, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 19 to 24 September 2016 in Bonn, Germany.

* In the symbol for this document, 2015 refers to the year in which the inventory was submitted, not to the year of publication.

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I. Introduction[1]

1. This report covers the review of the 2015 annual submission of the European Union organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (hereinafter referred to as the UNFCCC review guidelines) and particularly part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 19 to 24 September 2016 in Bonn, Germany, and was coordinated by Mr. Vitor Gois Ferreira and Mr. Pedro Torres (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of the European Union.

Table 1
Composition of the expert review team that conducted the review of the European Union

Area of expertise	*Name*	*Party*
Generalist	Mr. Riccardo De Lauretis	Italy
	Mr. Giorgi Mukhigulishvili	Georgia
Energy	Mr. Lawrence Kotoe	Ghana
	Mr. Takashi Morimoto	Japan
	Ms. Audace Ndayizeye	Burundi
	Ms. Regine Röthlisberger	Switzerland
IPPU	Ms. Marisol Bacong	Philippines
	Mr. Kent Buchanan	South Africa
	Mr. Roman Kazakov	Russian Federation
Agriculture	Mr. Sorin Deaconu	Romania
	Mr. Asaye Ketema Sekie	Ethiopia
LULUCF	Mr. Max Collett	Australia
	Ms. Paula Ollila	Finland
	Mr. Juan José Rincón Cristóbal	Spain
	Mr. Iordanis Tzamtzis	Greece
Waste	Ms. Violeta Hristova	Bulgaria
	Mr. Gustavo Mozzer	Brazil
Lead reviewers	Mr. Riccardo De Lauretis	
	Mr. Asaye Ketema Sekie	

[1] At the time of publication of this report, the European Union had submitted its instrument of ratification of the Doha Amendment but the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

2. This report contains findings based on the assessment by the ERT of the 2015 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings, and if applicable, the ERT's encouragements to resolve them, are also included.

3. A draft version of this report was communicated to the European Union, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual greenhouse gas emissions for the European Union, including totals excluding and including the land use, land-use change and forestry sector, indirect carbon dioxide emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and additional activities under Article 3, paragraph 4, of the Kyoto Protocol, if elected, by gas, sector and activity for the European Union.

5. Information to be included in the compilation and accounting database can be found in annex II.

6. The ERT notes that the European Union's 2015 annual submission was delayed, consistent with decision 6/CMP.9, paragraph 4. As a result, the review of the 2015 annual submission is being held in conjunction with the review of the 2016 annual submission, in accordance with decision 10/CMP.11, paragraph 1. To the extent that identical information is presented in both annual submissions, the ERT has reviewed this information only once, and, as appropriate, has replicated the findings below in both the 2015 and the 2016 annual review reports.

II. Summary and general assessment of the 2015 annual submission

7. Table 2 provides the ERT assessment of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5 below.

Table 2
Summary of review results and general assessment of the inventory of the European Union

Assessment			*Issue or problem ID[a](s) in tables 3 and/or 5[b]*
Dates of submission	Original submission: 15 April 2016 (NIR), 27 June 2016, version 3 (CRF tables), 15 April 2016 (SEF-CP1-2015, SEF-CP2-2013, SEF-CP2-2014, SEF-CP2-2015) Revised submissions: 21 June 2016 (NIR), 9 September 2016 and 14 December 2017, version 4 (CRF tables), 21 June 2016 (SEF-CP2-2014) The CRF tables of 14 December 2017 and the NIR of 21 June 2016 are used in this report unless otherwise specified		
Review format	Centralized		
Application of the requirements of	Have any issues been identified in the following areas:		
	1. Identification of key categories	Yes	G.12

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Assessment				*Issue or problem ID[a](s) in tables 3 and or 5[a]*
the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	2.	Selection and use of methodologies and assumptions	Yes	E.5, E.9, E.15, I.24, I.31, I.35, I.37, I.40, I.41, A.7, A.15, A.16, L.12, L.20, KL.18
	3.	Development and selection of emission factors	Yes	I.32, I.43
	4.	Collection and selection of activity data	Yes	E.6, E.8, I.12, I.34, I.38, I.46, A.12
	5.	Reporting of recalculations	No	
	6.	Reporting of a consistent time series	Yes	I.15, A.4, L.16
	7.	Reporting of uncertainties, including methodologies	No	
	8.	QA/QC	QA/QC procedures were assessed in the context of the national system (see below)	
	9.	Missing categories/completeness[b]	Yes	L.1, L.2, L.7, L.17, L.19, L.21, KL.5, KL.8, KL.9, KL.10, KL.11, KL.14, KL.19
	10.	Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?		The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?		Yes	
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:			
	1.	National system:		
		(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
		(b) Performance of the national system functions	No	
	2.	National registry:		
		(a) Overall functioning of the national registry	No	
		(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	3.	ERUs, CERs, AAUs and RMUs and on information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR	No	
	4.	Matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission	No	

Assessment			*Issue or problem ID[a](s) in tables 3 and or 5[a]*
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.15, KL.20
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	No	
	(c) The Party has reported information in accordance with decision 6/CMP.9	No	
	(d) The Party plans to apply the provisions for natural disturbances to afforestation and reforestation	NA[c]	
	(e) The Party plans to apply the provisions for natural disturbances to forest management	NA[c]	
	(f) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	No	
	(g) Other issues	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next[d] review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, CPR = commitment period reserve, CRF = common reporting format, ERT = expert review team, ERU = emission reduction unit, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NIR = national inventory report, QA/QC = quality assurance/quality control, RMU = removal unit, SEF = standard electronic format, SIAR = standard independent assessment report, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", Wetlands Supplement = *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] The ERT identified additional issues in the energy, industrial processes and product use, agriculture, LULUCF and waste sectors as well as for LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol that are not specifically listed in table 2 but are included in table 3 and/or 5.

[b] Missing categories, for which methods are provided in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, may affect completeness and are listed in annex III to this document.

[c] Election of application of provisions for natural disturbances is done at member State level in accordance with information in table 10.

[d] Owing to the timing of the review of the 2015 annual submission, "next" in this context refers to the review of the 2017 annual submission.

III. Status of implementation of issues and/or problems raised in the previous review report

8. Table 3 compiles all the recommendations made in the previous review report. For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2015 annual submission and provided the rationale for its determination, taking into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of the European Union

ID[a]	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Activity data (15, 2014) Transparency	Provide justifications in the NIR as to why the use of international data sources to report AD at individual Party level would lead to strongly inaccurate reporting	Not resolved. During the review, the European Union explained that according to its QA/QC programme, member States are responsible for the quality of the AD, EFs and other parameters used for their inventories. Therefore, using international data sources for the European Union would imply that the data reported by the countries to international data sources are considered more accurate than those used by the national inventory compilers and would lead to inconsistencies with member States' inventories, which would contradict the QA/QC programme of the European Union. The ERT agrees with the explanation provided by the Party. The European Union further stated that it would include this information in the NIR of the 2017 GHG inventory submission
G.2	Activity data (20, 2014) Transparency	Continue ensuring consistency between the EU ETS data and inventory data across member States	Resolved. The ERT noted that the European Union has provided additional information on consistency between EU ETS data and inventory data. The European Union reports in the NIR that under Article 7 of the Monitoring Mechanism Regulation,[c] member States are required to perform consistency checks between the emissions reported in their GHG inventories and the verified emissions reported under the EU ETS directive (see section 1.4.1.3 of the NIR)
G.3	Methods (14, 2014) Transparency	Work with member States in order to report consistent notation keys among member States for describing the completeness of the overall inventory	Addressing. The European Union explained that it conducts initial checks on its member States focusing on the notation key "NE". The European Union further explained that the recommendation will continue to be carried out after the 2016 reviews of member States submissions have been completed
G.4	Methods (20, 2014)	Include in the NIR a mapping table indicating the correspondence between the scope of EU ETS activities and the	Resolved. The European Union has included in the NIR a table showing the correspondence between the scope of EU

ID[a]	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency	IPCC categories, with supporting comments	ETS activities and the 2006 IPCC Guidelines' categories for the energy and IPPU sectors (see table 1.8 of the NIR)
G.5	National registry (141, 2014) Transparency	Include in the NIR all information in response to the findings in the SIAR in accordance with decision 15/CMP.1, annex, chapter I.G	Not resolved. The Party's submission did not contain information related to the national registry, including the responses to previous recommendations of the ERT pertaining to the national registry
G.6	NIR (16, 2014) Transparency	Improve the transparency of the reporting by ensuring that explanatory information regarding the emission and IEF trends within the energy and agriculture sectors is included in the NIR	Resolved. The ERT considers that the information provided with regard to the decrease in emissions in the energy sector for 2009, owing to the economic crisis, and the N_2O IEF for gasoline in road transportation is transparently described in the NIR. The ERT further considers that the required explanation for the trend of CH_4 emissions from enteric fermentation for France, Greece and Luxembourg, which was missing from the 2014 NIR, is no longer relevant owing to the new structure of the NIR implemented by the European Union
G.7	Uncertainty analysis (32, 2014) Comparability*	Use approach 1 to estimate the total uncertainty of the inventory and use approach 2 for reporting purposes only after completion of its development	Resolved. The European Union used an approach based on approach 1 of the 2006 IPCC Guidelines to estimate the uncertainty of the IPPU and agriculture sectors and provided a detailed description of the method used in the NIR (section 1.6)
G.8	Uncertainty analysis (33, 2014) Transparency	Describe any changes in overall uncertainty estimates in the NIR	Not resolved. During the review, the Party stated that the uncertainty estimates were conducted for the first time under the new UNFCCC Annex I inventory reporting guidelines and that any differences in the overall uncertainty can only be described from 2017 onwards
G.9	Uncertainty analysis (35, 2014) Transparency	Include in the next NIR more details regarding archiving from the document "Quality management manual" with supporting references	Resolved. The ERT noted a new section in the NIR (section 1.3.2) on documentation and archiving. The new section includes information on the type of archived materials, location and structure of the folders and coding used to archive the information
G.10	Other (149, 2014) Transparency	Provide an update on the progress of implementation of all recommendations in the NIR	Resolved. In the NIR (table 10.7), the Party provided information on the status of implementation of each recommendation
Energy			
E.1	1. General (energy sector) (39, 2014) (32, 2013) Transparency	Enhance transparency and consistency with the reporting by member States when reporting on recalculations, by working with the member States to achieve the enhancement of the	Resolved. The European Union has implemented a procedure to check the explanations of recalculations made by each member State and provided brief information on recalculations in the NIR

ID[a]	*Issue and/or problem classification[b, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
		European Union QA/QC system	
E.2	1. General (energy sector) (40, 2014) Transparency	Present methodological summaries that are consistent among member States and categories, at least for the key categories	Addressing. The European Union provided summary tables in the NIR on methodologies and EFs used by each member State for key categories in the energy sector and summary information on methodological descriptions as an annex. However, summary tables for significant key categories, such as public electricity and heat production (1.A.1.a) and manufacture of solid fuels and other energy industries (1.A.1.c), were not provided
E.3	Feedstocks, reductants and other NEU of fuels (45, 2014) Transparency	Provide transparent information on recalculations for CRF table 1.A(d) in the NIR	Not resolved. The European Union did not provide transparent information on recalculations for CRF table 1.A(d) and stated in the NIR that it will implement the recommendation from the previous review in its 2017 annual submission (p.720 of the NIR)
E.4	Feedstocks, reductants and other NEU of fuels (46, 2014) (35, 2013) (53, 2012) Transparency	Explain clearly the reporting of the use of weighted averages of carbon stored reported in CRF table 1.A(d) in the annual submission and make efforts to enhance the consistency of reporting among member States	No longer relevant. The European Union explained that the reporting of carbon stored is no longer required in CRF table 1.A(d). Therefore, the European Union does not use a weighted average and the member States do not use inconsistent carbon stored factors. The ERT agrees with the explanation provided by the European Union
E.5	Feedstocks, reductants and other NEU of fuels (47, 2014) Comparability*	Continue with efforts to ensure the consistency of the reporting among member States, in particular with regard to the allocation of emissions between the energy and IPPU sectors	Not resolved. The ERT welcomes the intention of the European Union to consider the consistent allocation of emissions by all member States (see E.12 in table 5). The European Union further stated that, for key categories and largest contributing member States, it will document in the NIR the reasons why member States do not follow the allocation of emissions in accordance with the 2006 IPCC Guidelines, in order to resolve the recommendation. The ERT agrees with the approach suggested by the European Union
E.6	International bunkers and multilateral operations (44, 2014) Accuracy*	Use the most recent results from the collaboration with Eurocontrol to improve the accuracy of the emission estimates for the European Union and for the member States, ensuring consistency in the time series in accordance with the IPCC good practice guidance and report on the results of the collaboration in the NIR	Not resolved. The results of the collaboration with Eurocontrol will only support the 2016 inventory submission
E.7	1.A.1 Energy industries all fuels – CO_2	Continue to improve the QA/QC procedures to ensure consistency	Addressing. The European Union has made further efforts to eliminate inconsistencies between the CRF tables

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(48, 2014) Transparency	between the CRF tables and the NIR	and the NIR. However, there are still inconsistent values between the CRF tables and the NIR (e.g. for CO_2 emissions from civil aviation (1.A.3.a)) because the NIR was not updated whereas the CRF tables were updated based on the resubmission of CRF tables from member States
E.8	1.A.3.a Domestic aviation – liquid fuels – CO_2 (49, 2014) Accuracy*	Promote the use of the results of the collaboration between the European Union and Eurocontrol to improve the accuracy of the inventory and report on the results of the collaboration in the NIR	Addressing. The data on fuel and emissions for the years 2005–2014 calculated by Eurocontrol were provided to each member State to support the inventory process for the 2016 submission and have been used by member States for checking purposes and/or emission calculations directly (see E.6 above). However, the European Union did not describe in the NIR the results of the Eurocontrol collaboration
IPPU			
I.1	2. General (IPPU) (56, 2014) Transparency	Provide justifications in the NIR as to why the use of international data sources to report AD at the European Union level would lead to strongly inaccurate reporting	Not resolved. The ERT accepts the explanation provided by the European Union during the review and requests the European Union to include this information in its NIR (see G.1)
I.2	2. General (IPPU) (57, 2014) Transparency	Improve the summary descriptions of methodologies in the NIR for all member States	Resolved. The ERT noted that the European Union improved the description of the methodologies used by providing summary descriptions of methodologies for all member States in annex III to the NIR
I.3	2.A.1 Cement production – CO_2 (59, 2014) Transparency	Include in the NIR the information provided by Germany to the European Union, clarifying that it had performed periodic checks using plant-specific data and that these indicate that the EFs used do not need to be revised	Resolved. The European Union included the required information in annex III to the NIR
I.4	2.A.1 Cement production – CO_2 (60, 2014) Transparency	Improve the information on the methodology used by the United Kingdom of Great Britain and Northern Ireland in the NIR to enhance transparency and to enable the ERT to conduct a thorough review of the AD and EFs used in the estimate of emissions from cement production	Resolved. Transparent information on the method used by the United Kingdom is provided in annex III to the NIR
I.5	2.A.1 Cement production – CO_2 (61, 2014) Transparency	Continue working with Spain in order that Spain implement a qualitative assessment of the range of IEFs and their trend, on the basis of the composition of the raw material used in the country	Resolved. The trend of the IEF is described in section 4.2 of the NIR and in section 4.3 of Spain's NIR
I.6	2.A.1 Cement production – CO_2	Work with Latvia to ensure that it uses a tier 2, rather than a tier 1, approach	Resolved. Latvia used a tier 2 method to estimate CO_2 emissions from cement

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(62, 2014) Accuracy*	when estimating cement production emissions	production and the description of the methodology is provided in annex III to the NIR
I.7	2.A.1 Cement production – CO_2 (63, 2014) Transparency	Include the relevant information from the NIR of Poland in the NIR of the European Union rather than just referring to the NIR of the member State	Addressing. Annex III to the NIR contains a reference to the NIR of Poland where the EFs and AD used to estimate emissions from cement production in Poland can be found. However, the information provided in annex III to the NIR is not correct as it states that a tier 1 method and default EFs are used by Poland, whereas Poland uses plant-specific and country-specific AD and EFs
I.8	2.A.2 Lime production – CO_2 (65, 2014) Transparency	Include information on the reporting of the approaches for the collection of AD in the NIR for Croatia in order to enhance the transparency of the description of methods	Resolved. The ERT notes that the approach for the collection of AD on carbonate consumption is provided in Croatia's NIR
I.9	2.A.2 Lime production – CO_2 (64, 2014) Transparency	Provide more information for Italy about the methods used to estimate emissions from lime production for the entire time series; in particular, there should be transparent documentation on whether the method is based on the amount of calcium carbonate from raw material or on the amount of calcium and magnesium oxides in the lime produced for each of the periods	Not resolved. The European Union included in the NIR only the description of the collection of AD for estimating CO_2 emissions from lime production. The information on the method applied by Italy and on whether the method is based on the amount of calcium carbonate from raw material or on the amount of calcium and magnesium oxides is not provided in the NIR
I.10	2.A.2 Lime production – CO_2 (64, 2014) Transparency	Provide more information for Italy about the underlying drivers for the changes in the IEF since 2005 and on how time-series consistency has been maintained	Resolved. The ERT noted that the European Union provided a precise reference as to where the requested information can be found (section 4.2.2 of Italy's NIR) and considers that the trend of the IEF is described therein
I.11	2.B.1 Ammonia production – CO_2 (66, 2014) Transparency	Provide in the NIR adequate and transparent methodology overviews for France and Germany to enable the ERT to conduct a thorough review of the AD and EFs used in the ammonia production emission estimates of these countries	Not resolved. The description of the methodologies, type of feedstocks, AD and EFs used, including a reference as to where the information could be found in the respective member States' NIRs, was provided during the review but was not included in the NIR
I.12	2.B.1 Ammonia production – CO_2 (67, 2014) Consistency	Make efforts to ensure that Greece completes the ongoing work to obtain more accurate data on the amount of liquid fuel used as feedstock and the updated AD for the emission estimates	Not resolved. Greece did not implement the planned improvement to accurately determine the amount of liquid fuel used as feedstock in ammonia production in the period 1992–1999 (see section 4.6.6 of the 2016 NIR of Greece). Greece reported emissions from liquid fuel used for ammonia production under the energy sector for the periods 1990–1993 and 1995–1998, rather than under the IPPU sector (see section 4.6.1 of the NIR of Greece)
I.13	2.B.2 Nitric acid	Provide in the NIR adequate	Resolved. The description is provided in

ID[a]	Issue and/or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
	production – N_2O (68, 2014) Transparency	methodology overviews for France, Germany and Greece to enable the ERT conduct a thorough review of the AD and EFs used in the nitric acid production emission estimates of those member States	annex III to the NIR
I.14	2.B.2 Nitric acid production – N_2O (69, 2014) Transparency	Improve the transparency of information provided in the NIR for Spain by finding alternative ways of reporting the necessary information without violating the existing rules on confidentiality	Resolved. The information on N_2O emissions from nitric acid production in Spain is presented in a transparent manner (see table 4.16 of the NIR)
I.15	2.B.7 Soda ash production – CO_2 (65, 2014) Consistency*	Work with Croatia to ensure the consistency of the time series of limestone and dolomite use	Not resolved. The time series of carbonate use in Croatia is inconsistent for limestone (1990–1999), dolomite (1997–2004) and soda ash (1990–1991)
I.16	2.B.10 Other (chemical industry) – CO_2 (70, 2014) Comparability*	Work with Finland in order to develop a way of reporting indirect CO_2 emissions which will allow CO_2 emissions from biomass to be distinguished from the fossil fuel component and use this in the CRF tables of the annual inventory submission, and provide an appropriate methodological description in the NIR	Resolved. The ERT considers that sufficient information has already been provided in the NIR and that the recommendation has been implemented by Finland (see section 9 of the NIR of Finland)
I.17	2.B.10 Other (chemical industry) – CO_2 (71, 2014) Transparency	Include in the NIR the methodological description of France for this subcategory	Resolved. The ERT notes that the methodology is described in the NIR of France (see section 4.3.2.7 of the NIR of France) and considers that sufficient information has already been provided in the NIR
I.18	2.B.10 Other (chemical industry) – CO_2 (72, 2014) Comparability*	Work with Germany to report follow-up information on the appropriate allocation of catalyst coke burn-off emissions	Resolved. The ERT noted that the emissions from catalyst coke off burning are reported by Germany under the energy sector (see section 3.2.3.2 of the NIR of Germany and Germany's CRF tables 2(I).A-H)
I.19	2.C.3 Aluminium production – CO_2 and PFCs (73, 2014) Transparency	Provide in the NIR adequate methodological overviews to enable the ERT to conduct a thorough review of the AD and EFs used in the aluminium production emission estimates provided by Greece, the Netherlands and Sweden	Not resolved. During the review, the European Union provided information on the methodology and EFs for the respective member States. However, this information is not included in the NIR of the European Union
I.20	2.F Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (74, 2014) Transparency	Endeavour to provide in the NIR summary overviews of methodologies used to estimate emissions from consumption of halocarbons and SF_6 for key categories based on the relevant methodological descriptions reported in the NIRs of member States	Not resolved. The ERT noted that the European Union provided, in annex III to the NIR, the description of the methodologies for estimating emissions from refrigeration and air-conditioning equipment (category 2.F.1). However, summary overviews of methodologies for the other key categories (2.F.2 and 2.F.4) were not included

ID[a]	Issue and or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
I.21	2.F Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (75, 2014) Transparency	Make the necessary corrections in the use of the notation keys to ensure the transparency of the reporting	Addressing. The ERT noted that the use of notation keys for reporting information on product uses as substitutes for ozone-depleting substances has been corrected by Denmark, Finland, the Netherlands and Spain. However, there are still instances where notation keys are incorrectly used; for example, Ireland still uses the notation keys "NE" and "NA" to report AD and emission estimates for refrigeration and air conditioning in CRF table 2(II)B-H
I.22	2.F Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (76, 2014) Transparency	Improve the transparency of the reporting regarding Luxembourg by providing background tables for consumption of halocarbons and SF_6	Resolved. The ERT noted that Luxembourg reported background information on consumption of halocarbons and SF_6 in its CRF table 2(II)B-H
I.23	2.F Product uses as substitutes for ozone depleting substances – HFCs, PFCs and SF_6 (76, 2014) Transparency	Work with Luxembourg in order to enhance the transparency of its reporting of fluorinated gases by providing all the relevant background information used for the calculations in both the NIR and the CRF tables	Resolved. The ERT noted that Luxembourg reported background information on fluorinated gases in its CRF table 2(II)B-H
I.24	2.F.3 Fire protection – HFCs, PFCs and SF_6 (78, 2014) Accuracy*	Work with Greece in order to implement appropriate country-specific methodologies to estimate HFC and/or PFC emissions in accordance with the IPCC good practice guidance	Not resolved. During the review, the European Union stated that the implementation of a country-specific methodology is ongoing. However, the ERT noted that no information was provided in the NIR on the steps taken in resolving the recommendation. The ERT also noted from the information provided in annex III to the NIR that no changes have been made with regard to the methodology used by Greece
I.25	2.F.6 Other applications (product uses as substitutes for ozone depleting substances) – HFCs, PFCs and SF_6 (77, 2014) Transparency	Include an explanation in the annual submission on the reporting of the emissions from the processes related to the use of HFCs and SF_6 in the Netherlands and enhance the QC procedures to ensure that the information in the NIR of the European Union accurately reflects the information in the NIRs of member States	Not resolved. The NIR of the Netherlands indicates that emissions from foam-blowing agents (subcategory 2.F.2), fire protection (subcategory 2.F.3), aerosols (subcategory 2.F.4) and solvents (subcategory 2.F.5) are all included under the subcategory other (2.F.6) owing to the sensitivity of the information, as many processes related to the use of HFCs take place in only one or two companies (see section 4.7.1 of the NIR of the Netherlands). However, the reporting of information (e.g. notation keys) in tables 4.36 and 4.37 of the NIR of the European Union, on the contribution of each member State to HFC emissions from subcategories 2.F.2 and 2.F.3, respectively, does not reflect the information reported in the NIR of the Netherlands. Moreover, the ERT also noted that the notation keys used by the Netherlands in its CRF table 2(II) do not

ID[a]	Issue and or problem classification[b, c]	Recommendation made in previous review report	ERT assessment and rationale
			appear to be consistent with the information in the NIR of the Netherlands on how emissions from subcategories 2.F.2, 2.F.3, 2.F.4 and 2.F.5 are reported
Agriculture			
A.1	3. General (agriculture) (84, 2014) Transparency	Report in the NIR on the outcome of the workshop to improve GHG inventories in the agriculture sector, including any planned improvements arising from the workshop	Resolved. In section 5.4.4 of its NIR, the European Union included a summary of the activities and workshops aiming to improve the quality of the information on the agriculture sector in national GHG inventories
A.2	3. General (agriculture) (85, 2014) Transparency	Correct the detected errors in CRF table 4.B(a) on the allocation of manure for swine, update the information on the EU-15 member States[d] and improve the implementation of QC procedures	Resolved. The European Union improved its QC procedures and detailed information is provided in the NIR (see section 5.4.3.1, p.520)
A.3	3. General (agriculture) (86, 2014) Transparency	Provide summary information on the roles and functions of references to European Union-based institutions and programmes in the annual submission	Resolved. In section 1.2 of the NIR, the European Union provided information on the roles and responsibilities of the institutions involved in preparing the GHG inventory submission, and in chapter 17 of the NIR, the European Union provided the definitions of the acronyms used in the NIR
A.4	3.B.3 Swine – N_2O (90, 2014) Consistency*	Elaborate an explanation for the increase in the nitrogen excretion rate for swine for Sweden in the NIR	Not resolved. During the review, the European Union explained that the issue was raised and followed up during the annual review process under the European Union effort-sharing decision[e] and the results therein indicate that: (1) the gap in the nitrogen excretion rate between 2001 and 2002 is an outlier and not linked with events in 2002; and (2) the updated values for the swine nitrogen excretion rate for 2002 are relevant for 2002 and the following years, and it is likely that the values used for the previous years are underestimated; and (3) it would be recommended to keep 1990 with the current nitrogen excretion rate (if relevant) and interpolate this parameter between 1990 and 2002 in order to avoid the outlier. The ERT noted that the trend of nitrogen excretion rates for swine for Sweden (CRF table 3.B(b) of Sweden) still shows a stepwise increase in the nitrogen excretion rate from 7.7 kg N/head/year to 9.0 kg N/head/year between 2001 and 2002. The ERT further noted that information on this issue is not yet provided in the NIR
A.5	3.D Direct and indirect N_2O emissions from agricultural soils –	Report the fraction of livestock nitrogen excreted and deposited onto soil during grazing in CRF table 4.D	Resolved. The ERT noted that the European Union has improved the QC procedure to check the difference between

ID	Issue and or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
	N_2O (91, 2014) Transparency	so that it is consistent with the reporting on CRF table 4.B(b) for the total for the European Union	the total nitrogen excreted in different manure management systems and the total reported nitrogen excreted to avoid inconsistency between the CRF tables
A.6	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (91, 2014) Transparency	Improve the QA/QC system to ensure that the AD reported in the CRF tables are internally consistent	Resolved. The ERT noted that the European Union has improved its QA/QC procedures (see section 5.4.3 of the NIR)
A.7	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (92, 2014) Comparability*	Work with member States to ensure more consistent reporting of the area of organic soils between the agriculture and LULUCF sectors	Addressing. During the review, the European Union explained that member States' submissions were checked for consistency between the agriculture and LULUCF sectors and four issues were identified and included in the European Environment Agency Emission Review Tool./ However, in the European Union submission of 9 September 2016, the ERT still observed a discrepancy in the total area of organic cultivated soils, which is reported in CRF table 3.D as 3 912.44 kha and is reported as the total area of organic soils in CRF tables 4.B and 4.C as 5 698.00 kha for 2013. During the review, the European Union stated that the issue will be resolved in the 2017 annual submission
LULUCF			
L.1	4. General (LULUCF) (13, 2014) (27, 2013) (12, 2012) Completeness*	Continue efforts to improve the completeness of the reporting of emissions from all mandatory source categories in the LULUCF sector	Addressing. The ERT noted that multiple instances of the use of the notation key "NE" in the CRF tables from the 2014 GHG inventory submission have been addressed by the Party (see KL.5 below and L.17, L.21, KL.8, KL.9, KL.10, KL.11 and KL.14 in table 5)
L.2	4. General (LULUCF) (95, 2014) (76, 2013) (86, 2012) Completeness*	Work with member States with a view to reporting mandatory pools and categories which are currently not estimated in order to increase the completeness of the inventory	Addressing. See L.1
L.3	4.A.1 Forest land remaining forest land – CO_2 (96, 2014) (79, 2013) (89, 2012) Transparency	Improve the transparency of the NIR, in particular by discussing in detail the main drivers leading to inter-annual variations, in particular for the most recent years	Resolved. The Party reported information on implied carbon stock change factors for each pool and category in the NIR, which greatly improved the transparency of the reporting (see section 6.2.1.2 of the NIR)
L.4	4.A.2 Land converted to forest land – CO_2 (97, 2014) (80, 2013) Transparency	Improve the transparency of the reporting, including the provision of updated information from member States and internal QA/QC checks in order to ensure that the aggregated reporting is complete and consistent among member States	Not resolved. The ERT noted that there is no information in the NIR to confirm whether the European Union made progress with Italy on the methodological issue referred to in the 2013 and 2014 individual review reports of the European Union

ID[a]	Issue and or problem classification[a, b]	Recommendation made in previous review report	ERT assessment and rationale
L.5	4.B.1 Cropland remaining cropland – CO_2 (98, 2014) Transparency	Provide justifications for the overall trends for the area of cropland remaining cropland, and the dead organic matter, soil organic carbon and living biomass pools	Resolved. The ERT considers that transparent information on the overall trends of the European Union for the area and emissions of cropland remaining cropland, and the dead organic matter, soil organic carbon and living biomass pools, have been included in the NIR (see section 6.2.2.2 of the NIR)
L.6	4.B.2 Land converted to cropland – CO_2 (99, 2014) Transparency	Provide transparent explanations in the annual submission, indicating the key drivers for the changes in the trend and recalculations	Not resolved. The European Union has not provided the requested information in its NIR. During the review, the Party provided the requested information, but it is not included in the NIR
L.7	4.B.2 Land converted to cropland – CO_2 (100, 2014) (81, 2013) (92, 2012) Completeness*	Work with the member States to improve the completeness of their reporting and use higher-tier methods in order to enhance accuracy	Addressing. The ERT notes that the current reporting approach does not allow for the review of completeness under land converted to cropland by country and by pool. Nevertheless, the ERT notes that the notation key "NE" is still used for reporting information on mineral soils under land converted to cropland for Cyprus (see table 6.6 of the NIR)
L.8	4.C.1 Grassland remaining grassland – CO_2 (102, 2014) Transparency	Continue to progress efforts with Italy on the reporting of carbon stock changes in living biomass and document the reasons for inter-annual variations in the NIR	Resolved. In the NIR, the Party provided additional information regarding the main trends and drivers for the subcategory grassland remaining grassland (see section 6.2.3.2 of the NIR). Additionally, the inter-annual variability is no longer driven by fires in Italy and, therefore, the direct reference to these changes should not necessarily be included
L.9	4.C.1 Grassland remaining grassland – CO_2 (103, 2014) Transparency	Provide general information on the key drivers that explain the variations in each member State when significantly affecting the aggregate estimates of the European Union	Resolved. In the NIR, the Party has provided transparent information on the main contributors, drivers and trends for the subcategory grassland remaining grassland (see section 6.2.3.2 of the NIR)
L.10	4.F.2 Land converted to other land – CO_2 (104, 2014) (85, 2013) Transparency	Include transparent explanations in the NIR for the inter-annual variations and work with the member States to improve the consistency of their reporting	Not resolved. The European Union has not provided the requested information in its NIR. During the review, the Party provided the requested information, but it is not included in the NIR
L.11	4(V) Biomass burning – CO_2, CH_4 and N_2O (105, 2014) Transparency	Include the reasons for the use of the notation key "NE" where applicable and make efforts to increase the completeness of the reporting	Not resolved. The ERT notes that the information regarding the use of the notation key "NE" is not included in the NIR
Waste			
W.1	5. General (waste) (108, 2014) Transparency	Improve the transparency of the reporting for the waste sector	Resolved. The ERT noted that the European Union has improved the transparency of its reporting by providing additional information on the drivers for the decrease in emissions in the waste sector (see p.659 of the NIR)

ID[a]	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
W.2	5. General (waste) (110, 2014) Transparency	Enhance the QA/QC procedures in order to ensure consistency between the NIR and the CRF tables	Resolved. The ERT noted that similar errors in the figures reported in the NIR did not occur. The ERT further noted that the table titles are consistent with the table contents in the NIR
W.3	5.A Solid waste disposal on land – CH_4 (111, 2014) Transparency	Provide relevant AD in the NIR, including data on municipal waste disposal on land	Resolved. The European Union provided information on AD for waste disposal on land (see figure 7.7 of the NIR)
W.4	5.A Solid waste disposal on land – CH_4 (112, 2014) Transparency	Update the description of the methodologies used to estimate CH_4 emissions in a transparent manner in the NIR	Resolved. The ERT noted that the European Union improved its reporting regarding the description in the NIR of the methodology used to estimate CH_4 emissions and included a summary of the methodology used by each member State in annex III to its NIR
W.5	5.C.1 Waste incineration – CH_4 and N_2O (117, 2014) Transparency	Combine NIR tables 8.12 and 8.13 on waste incineration	Resolved. The European Union has provided information on CO_2, CH_4 and N_2O emissions from waste incineration in a combined table (see table 7.8 of the NIR)
W.6	5.D Wastewater treatment and discharge – CH_4 and N_2O (115, 2014) Transparency	Include information on trends in emissions from industrial wastewater from those member States that significantly affect the trend of emissions for this category at the European Union level	Resolved. The European Union has provided information on emission trends for key sectors, including industrial wastewater (see figure 7.14 of the NIR). The European Union has further provided additional information on those member States that contribute most to the observed trend
KP-LULUCF			
KL.1	General (KP-LULUCF) (121, 2014) Transparency	Work with and support member States to improve consistency in the use of notation keys and further improve the transparency of future submissions	Not resolved. The ERT noted that consistency in the use of notation keys and transparency are still an issue (e.g. the notation key "NO" is used by some member States when the activity exists and there are no changes in management, while others consider the activity insignificant and use the notation key "NE")
KL.2	Afforestation and reforestation – CO_2 (123, 2014) Transparency	Improve QA/QC procedures to ensure that identified reporting errors do not occur	Resolved. Similar errors in the reporting of information from the Netherlands did not occur in the current submission
KL.3	Deforestation – CO_2 (125, 2014) Transparency	Work with member States so that they use the appropriate notation keys and provide a synthesis in the NIR of the explanations and justifications provided by member States	Not resolved. The synthesis of explanations and justifications provided by member States on the use of notation keys was not included in the NIR
KL.4	Deforestation – CO_2 (126, 2014) Transparency	Improve further the consistent use of notation keys and the transparency of their use	Resolved. The notation keys reported by Finland and Spain in relation to biomass burning on deforestation areas have been corrected

ID[a]	*Issue and or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
KL.5	Forest management – CO_2 (130, 2014) Completeness*	Work with member States to ensure that future reporting on forest management is complete and accurate	Not resolved. The information on member States' forest management is not complete (e.g. France underestimates unmanaged forests, while Cyprus and Malta do not report all pools and Hungary does not report the dead organic matter and soil organic carbon pools)

Abbreviations: AD = activity data, CRF = common reporting format, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, GHG = greenhouse gas, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NE = not estimated, NEU = non-energy use, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, SIAR = standard independent assessment report, 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are further classified as defined in decision 13/CP.20, annex, paragraph 81. In the review of the supplementary information reported in accordance with Article 7, paragraph 1, of the Kyoto Protocol, the ERT has applied the classification in decision 22/CMP.1, annex, paragraph 69, in conjunction with decision 4/CMP.11.

[b] An asterisk is included next to each issue type for all issues that are also problems, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] Regulation No. 525/2013 of the European Parliament and of the Council on a mechanism for monitoring and reporting GHG emissions and for reporting other information at national and European Union level relevant to climate change.

[d] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

[e] Decision No. 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

[f] See <https://emrt.eea.europa.eu/>.

IV. Issues identified in three successive reviews and not addressed by the Party

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2015 annual submission of the European Union, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by the European Union

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[b]
General		
	No such general issues were identified	
Energy		
	No such issues for the energy sector were identified	
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		

ID#[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[b]
L.1*	Continue efforts to improve the completeness of the reporting of emissions from all mandatory source categories in the LULUCF sector	4 (2012–2015/2016)
L.2*	Work with member States with a view to reporting mandatory pools and categories which are currently not estimated in order to increase the completeness of the inventory	4 (2012–2015/2016)
L.4	Improve the transparency of reporting, including the provision of updated information from member States and internal QA/QC checks, in order to ensure that the aggregated reporting is complete and consistent among member States	3 (2013–2015/2016)
L.7*	Work with the member States to improve the completeness of their reporting and use higher-tier methods in order to enhance accuracy	4 (2012–2015/2016)
L.10	Include transparent explanations in the NIR for the inter-annual variations and work with the member States to improve the consistency of their reporting	3 (2013–2015/2016)
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NIR = national inventory report, QA/QC = quality assurance/quality control.

[a] An asterisk is included after any issue ID# where the underlying issue is related to accuracy or completeness of a key category, a missing category or a potential key category, as indicated in decision 13/CP.20, annex, paragraph 83.

[b] The review of the 2015 annual submission is being held in conjunction with the review of the 2016 annual submission. As the reviews of the 2015 and 2016 annual submissions are not "successive" reviews, but are rather being held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 is considered as one year. The expert review team noted that this table 4 is the same as that in the 2015 annual review report for the European Union, modified to reflect the combined 2015/2016 review.

V. Additional findings made during the 2015 technical review

10. Table 5 contains findings made by the ERT during the technical review of the 2015 annual submission of the European Union that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2015 technical review of the annual submission of the European Union[a]

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
General			
G.11	Annual submission	The Party has indicated that its official inventory submission of 2016, and the CRF submissions of 9 September 2016 and 14 December 2017, constitutes a submission under the UNFCCC for the year 2016, a resubmission under the UNFCCC for the year 2015 and a submission under the Kyoto Protocol for the years 2015 and 2016. The ERT notes that the 2016 submission contains only information on recalculations between the original 2015 submission and the 2016 submission, and that information as to the full extent of the recalculations between the 2014 submission and the final 2015 submission was not included The ERT concludes that this situation was related to the unique circumstances referred to in paragraph 6 above	Not an issue
G.12	Key category analysis	The ERT noted that in table 11.4 of the NIR, the information on the key category analysis is not reported for many member States. Furthermore, the European Union did not report any information in CRF table NIR-3 on a summary overview for the key categories for KP-LULUCF activities. During the review, the European Union explained that information was not reported in CRF table NIR-3 owing to technical issues with CRF Reporter for several member States. In addition, the Party also explained that all member States except three (Cyprus, Malta and Portugal) provided a key category analysis in their NIR. Furthermore, the European Union explained that the issue was already being addressed The ERT recommends that the European Union improve its collaboration with member States and provide complete reporting of the key categories for KP-LULUCF activities in CRF table NIR-3	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines
G.13	Kyoto Protocol units	The ERT notes that the European Union, its member States and Iceland stated that they would fulfil their emission reduction targets under the second commitment period jointly During the review, the ERT noted that the sum of the base-year emissions of the member States and Iceland was incorrectly calculated. Furthermore, the European Union clarified during the review that in the context of the 2016 review of the reports to facilitate the calculation of the assigned amount of member States and Iceland for the second commitment period of the Kyoto Protocol, some member States had already started receiving their respective list of potential problems, which may lead to recalculations or adjustments of their base-year emissions As the base-year emissions of the European Union are calculated based on the sum of the base-year emissions of member States and Iceland, the ERT considers that the original submission of the European Union's report to facilitate the calculation of the assigned amount cannot be used by the ERT for the review of the base-year emissions of the European Union owing to potential recalculations or adjustments of the base-year emissions of member States and Iceland	Not an issue

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
		Consequently, the ERT included this issue in the list of potential problems. In its written response to this list, submitted on 14 December 2017, the European Union provided a revised submission of its report to facilitate the calculation of the assigned amount with revised base-year emission estimates (5 875 692 700 t CO_2 eq, including GHG emissions from deforestation)	
		The ERT agrees with the revised estimate of the base-year emissions of the European Union	
G.14	National system	In its original report to facilitate the calculation of the assigned amount, the European Union reported that the final extent of the territorial coverage of the United Kingdom for the second commitment period of the Kyoto Protocol had yet to be fully determined	Not an issue
		During the review, the European Union informed the ERT that the territorial coverage of the United Kingdom includes emissions from the United Kingdom's crown dependencies and those United Kingdom overseas territories that were included in the list of territories under the United Kingdom's ratification of the Convention and its Kyoto Protocol during the first commitment period. The European Union further clarified that the final extent of the territorial coverage of the United Kingdom for the second commitment period of the Kyoto Protocol has yet to be fully determined, as it will depend on which of the United Kingdom's crown dependencies and overseas territories join the United Kingdom's ratification in respect of the second commitment period	
		Therefore, the ERT noted, at that time, that the final extent of the territorial coverage of the European Union was fully determined and included this issue in the list of potential problems	
		On 14 December 2017, the European Union resubmitted its CRF tables and its initial report and clarified that the territorial coverage of the United Kingdom had been extended to include complete coverage of emissions from the United Kingdom, its crown dependencies (Guernsey, Jersey and the Isle of Man) and its overseas territories that have joined the United Kingdom's ratification of the Convention and intend to join the United Kingdom's ratification of the Kyoto Protocol during its second commitment period (Cayman Islands, Falkland Islands and Gibraltar). The European Union further noted that Bermuda and Montserrat are not included in the United Kingdom's territorial coverage for the second commitment period	
		The ERT considers that the final extent of the territorial coverage of the European Union is correctly determined and that the potential question of implementation was resolved	
G.15	NIR	The ERT noted that the comment box included in some of the figures of the NIR is not legible (e.g. figures 3.4, 3.7 and 3.9 for the energy sector and figures 4.3–4.13 for the IPPU sector). During the review, the European Union informed the ERT that non-legible text should read as follows: "Countries are sorted by the average contribution to the sum of the EU-28 member States plus Iceland value over the whole time period". In addition, the European Union clarified that the top 10 countries are displayed and the other 19 reporting countries with data are lumped to 'other'	Not an issue

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		The ERT encourages the European Union to ensure that the information included in the figures of the NIR is legible	
Energy			
E.9	1. General (energy sector) – gaseous, liquid and solid fuels – CO_2, CH_4 and N_2O	The European Union has provided information in tabular format on the methods and EFs used by individual member States to estimate emissions from the energy sector (e.g. see tables 3.12, 3.14, 3.21–3.23, 3.25, 2.26, 3.28–3.30, 3.33, 3.35, 3.37–3.39 and 3.41–3.43 of the NIR). Based on this information, some member States use a tier 1 method for estimating emissions from some key categories of the European Union inventory. The ERT considers that if most of the key categories in the GHG inventory of the European Union are also key categories in the individual member States, then emissions from these key categories should be estimated using a tier 2 or higher methodology. During the review, the European Union stated that the consideration of the key categories by member States should reflect the conclusions of the 3rd meeting of the greenhouse gas inventory lead reviewers and should consider the categories that are key at the level of the compiled inventory, and the contribution of individual national inventories to the total emissions in these key categories. Where estimates of individual national inventories represent a high proportion of emissions in a key category (e.g. if the relative contribution of the estimates of these inventories ranked by level account for 60–75% of emissions in the category), the ERT should assess whether these estimates were prepared using an appropriate (e.g. higher-tier) method	Yes. Accuracy*
		The ERT recommends that the European Union work with its member States to improve the methodology used to estimate emissions from key categories by using a methodological tier for each member State in accordance with the decision trees in the 2006 IPCC Guidelines, the key category analysis of the European Union and the relative importance of the contribution of member State emissions to total emissions at the European Union level	
E.10	1. General (energy sector) – CO_2 and CH_4	The ERT noted that some member States (e.g. Romania, Slovakia and the United Kingdom) reported CH_4 recovery from coal mining, and oil and natural gas production. In the NIR, the European Union stated that CH_4 recovered is excluded from the category where it is recovered and emissions from its combustion are reported under the respective fuel combustion category. However, there is no clear description of the fuel combustion categories under which the emissions from the combustion of CH_4 recovered are included	Yes. Transparency*
		The ERT recommends that the European Union provide information in the NIR on the fuel combustion categories under which the emissions from the combustion of CH_4 recovered are included	
E.11	1. General (energy sector) – CO_2 and CH_4	The ERT noted that information on emission trends, methodologies and EFs is missing for the following key categories: (1) CO_2 emissions from public electricity and heat production – peat (subcategory 1.A.1.a); (2) CH_4 emissions from residential – solid fuels (subcategory 1.A.4.b); and (3) CO_2 emissions from venting and flaring (subcategory 1.B.2.c). During the review, the European Union explained that these are new key categories and would be considered in detail in the 2017 GHG emissions inventory, as stated in footnote 18 to	Yes. Transparency*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		the NIR (p.99) The ERT recommends that the European Union include in the NIR summary information on emission trends, methodologies and EFs for the following key categories: (1) CO_2 emissions from public electricity and heat production – peat (subcategory 1.A.1.a); (2) CH_4 emissions from residential – solid fuels (subcategory 1.A.4.b); and (3) CO_2 emissions from venting and flaring (subcategory 1.B.2.c)	
E.12	Feedstocks, reductants and other NEU of fuels – all fuels – CO_2	The ERT noted that the European Union included in the NIR information on feedstocks and other NEU of fuels as provided by member States (table 3.119, p.350), whereas the data reported in CRF table 1.A(d) on feedstocks, reductants and other NEU of fuels was taken directly from Eurostat. The ERT also noted that the information provided in the NIR is not consistent among member States and does not provide a transparent description of feedstocks, reductants and other NEU of fuels. During the review, the European Union confirmed that it is working on improving the transparency for the reporting of feedstocks, reductants and other NEU of fuels, but that this improvement is planned for the 2017 GHG inventory submission The ERT recommends that, in order to ensure a transparent reporting of feedstocks, reductants and NEU of fuels, the European Union provide in the NIR an explanation of why the information reported in CRF table 1.A(d) on feedstocks, reductants and other NEU is different from that reported by the Parties	Yes. Transparency*
E.13	1.A. Fuel combustion sectoral approach – all fuels – CO_2	The European Union reported for some key categories the mean and standard deviation of all reported IEFs of individual member States and the IEFs of member States that lie outside this range for the entire time series (e.g. figures 3.39, 3.44, 3.46, 3.48, 3.50, 3.55, 3.62, 3.69, 3.73 and 3.82 of the NIR) and compared the IEFs with the default EFs provided in the 2006 IPCC Guidelines. The ERT noted that in some instances it was not entirely clear how the EFs from the 2006 IPCC Guidelines shown in the NIR were selected, why the EFs did not correspond to the IEFs in the corresponding CRF tables of the European Union, and why some IEFs of individual member States lay far outside the IPCC default range. During the review, the European Union provided detailed information regarding the choice of default EFs from the 2006 IPCC Guidelines and explained why the mean values shown in the figures in the NIR (e.g. in figures 3.50, 3.73 and 3.82) were different from the IEFs provided in the CRF tables and why the IEFs of individual countries lay outside the IPCC default range The ERT recommends that the European Union report information regarding the choice of default EFs from the 2006 IPCC Guidelines and the reasons for particularly high or low IEFs of individual member States	Yes. Transparency*
E.14	1.A.2.g Other (manufacturing industries and construction) – all fuels – CO_2, CH_4 and N_2O	The ERT noted that the European Union reported in table 3.45 of its NIR information on emissions from the subcategory manufacturing industries and construction – other (1.A.2.g) and from the subcategory manufacturing industries and construction – other (off-road vehicles and other machinery) (1.A.2.g.vii). The ERT also noted that for some member States (Greece, Lithuania, Portugal and Slovakia), the European Union used the notation key "IE" when reporting information on these subcategories. While the reporting of emissions from subcategories 1.A.2.g.i–viii is not mandatory, the ERT acknowledges the efforts of the	Not an issue

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		European Union and its member States to separate stationary and mobile emissions. However, in CRF table 1.A(a), the AD and emissions under source category 1.A.2.g are not disaggregated into different fuel types or further subcategories	
		The ERT encourages the European Union to disaggregate emissions under the subcategory manufacturing industries and construction – other (1.A.2.g) into mobile and stationary emissions and into the appropriate fuel types for all member States and report the corresponding information in CRF table 1.A(a)	
E.15	1.A.3.b Road transportation – liquid fuels – CO_2, CH_4 and N_2O	Emissions from lubricants that are intentionally mixed with fuel and combusted in two-stroke engines should be accounted for in the energy sector and emissions from primary usage of lubricants (i.e. for lubrication or coating) should be accounted for in the IPPU sector in accordance with the 2006 IPCC Guidelines. However, there is no clear information in the NIR on how the European Union and each member State reported emissions from the use of lubricants under the transport (1.A.3) and/or lubricant use (2.D.1) categories. During the review, the European Union explained that it checks the allocation of emissions from use of lubricants between the transport and lubricant use categories for each member State, and only Belgium and Germany reported emissions from lubricants under the transport category, whereas other member States reported these emissions under the lubricant use category	Yes. Comparability*
		The ERT recommends that the European Union provide summary information on how each member State has reported the emissions from use of lubricants under the transport (1.A.3) and/or lubricant use (2.D.1) categories and work with the member States to report emissions from lubricants combusted in two-stroke engines under the transport category in accordance with the 2006 IPCC Guidelines	
E.16	1.C Carbon dioxide transport and storage – CO_2	The European Union stated in section 3.2.7 of the NIR that carbon dioxide capture and storage is not a key category and that no country reports information on carbon dioxide capture and storage. However, in CRF table 1.C of its submission of 9 September 2016, the European Union reported a total amount of CO_2 captured for storage (134.52 kt CO_2 in 2013) as an information item. During the review, the European Union explained that the reported amount reflects the CO_2 captured in pulp and paper mills in Finland, where precipitated calcium carbonate is formed and then used in the paper and paperboard industry. The final use of the CO_2 captured is considered as long-term storage except if the products are combusted. The resulting fossil CO_2 emissions from combustion of products containing precipitated calcium carbonate are taken into account in the corresponding categories in the GHG inventory of Finland	Not an issue
		The ERT encourages the European Union to include in the NIR information on CO_2 capture and storage that explains and reflects the amounts reported in CRF table 1.C	
IPPU			
I.26	2. General (IPPU)	The ERT noted that information on the methods used to estimate GHG emissions from the IPPU sector was provided in section 4 and in annex III to the NIR. However, the ERT noted that the identification of the tier methods and data sources was often inconsistent between the NIR and annex III to the NIR. For example, the	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		information in table 4.4 of the NIR on the tier method and EF used by Denmark, France, Greece and Lithuania to estimate emissions from cement production is not consistent with the information provided in annex III to the NIR. Similar inconsistencies were identified for other categories of the IPPU sector	
		The ERT recommends that the European Union provide consistent information on the methodologies used to estimate GHG emissions from the IPPU sector within the NIR, while also ensuring consistency with the NIRs of member States	
I.27	2. General (IPPU)	The ERT noted that the information on the tier method complexity, as required by paragraph 50(b) of the UNFCCC Annex I inventory reporting guidelines was frequently not provided for the categories of several member States in annex III to the NIR. Often, the European Union identified only the general approach followed (e.g. country-specific, plant-specific) instead of the tier method used (i.e. tier 1, 2 or 3 of the 2006 IPCC Guidelines). The lack of information on the method used in these cases does not allow the ERT to assess whether the methods used for the key categories are in accordance with the 2006 IPCC Guidelines (see ID#s I.29 and I.30 below)	Yes. Transparency*
		The ERT recommends that the Party identify which tier method was used to estimate emissions under each key category of the IPPU sector, in accordance with the 2006 IPCC Guidelines, and provide the corresponding tier method when a country-specific method is used	
I.28	2.A.1 Cement production – CO_2	The European Union reported in the NIR that Poland used a tier 1 method and default EF to estimate CO_2 emissions from cement production. During the review, the European Union explained that Poland no longer uses a tier 1 method and that a tier 2 method has been used to calculate CO_2 emissions from cement production since 2005, when plant-specific data became available under the EU ETS, and that this information is provided in the NIR of Poland	Yes. Transparency*
		The ERT recommends that the European Union correct the information provided in the NIR on the method used by Poland to estimate CO_2 emissions from cement production	
I.29	2.A.1 Cement production – CO_2	The European Union reported in the NIR that Cyprus, Greece, Hungary, the Netherlands and Sweden used a country-specific method to estimate CO_2 emissions from cement production (see table 4.4 of the NIR), without specifying the corresponding level of complexity (IPCC tier) in accordance with decision 24/CP.19, annex I, paragraph 50(b). During the review, the European Union explained that member States' submissions are part of the European Union submission and that the information on the level of complexity of the methodology used may be found in the member States' submissions	Yes. Transparency*
		The ERT recommends that the European Union provide information in the NIR on the corresponding level of complexity (IPCC tier) of the country-specific methods used by Cyprus, Greece, Hungary, the Netherlands and Sweden to estimate emissions from cement production	
I.30	2.A.2 Lime production	The ERT noted that the European Union did not report information on the methods and EFs used by Austria	Yes. Transparency*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
	– CO_2	and France to estimate CO_2 emissions from lime production (see table 4.5 of the NIR). Moreover, the European Union used the notation key "NA" to report the method and CO_2 EF for Malta even though emissions occurred in the country in the period 1990–1998 (see p.64 of the NIR of Malta). Furthermore, the European Union reported that Greece, Hungary and Sweden used a country-specific method to estimate CO_2 emissions from lime production, without specifying the corresponding level of complexity (IPCC tier) of those methods The ERT recommends that the European Union provide information in the NIR on the methods and EFs used by Austria, France and Malta and the level of complexity (IPCC tier) of the country-specific methods used by Greece, Hungary and Sweden to estimate CO_2 emissions from lime production	
I.31	2.A.2 Lime production – CO_2	The European Union used the notation key "IE" to report CO_2 emissions from lime production in the Netherlands (see table 4.6 of the NIR), without specifying where in the inventory the emissions have been included. During the review, the European Union explained that CO_2 emissions from lime production in the Netherlands are included under the energy sector (subcategory 1.A.2.c) because lime production in the Netherlands occurs only in four sugar industry plants and it is not possible to separate emissions from lime production from other emissions. The ERT considers that, in accordance with the 2006 IPCC Guidelines, emissions from lime production are to be reported under the IPPU sector The ERT recommends that the European Union work with the Netherlands to report CO_2 emissions from lime production under the lime production category (2.A.2) in accordance with the 2006 IPCC Guidelines	Yes. Comparability*
I.32	2.A.2 Lime production – CO_2	The ERT noted that the CO_2 IEFs for lime production for the United Kingdom (0.45 t/t), Latvia (0.55 t/t) and Croatia (0.58 t/t) for 2014 are significantly lower than the average value for the European Union (0.71 t/t) (see table 4.6 of the NIR). However, no information is provided in the NIR on why these IEFs are lower than the average value for the European Union. During the review, the European Union clarified that member States use different approaches to estimate emissions and, therefore, the IEFs are not comparable. The European Union further explained that the IEF may refer to tonnes of CO_2 per tonne of lime produced (i.e. in the case of Croatia and Latvia) but also tonnes of CO_2 per tonne of limestone consumed (i.e. in the case of the United Kingdom). Based on the response provided by European Union, the ERT considers that the CO_2 IEFs for lime production are not transparently reported in the NIR The ERT recommends that the European Union indicate in the NIR the units in which the AD and IEFs for the lime production category are reported (lime production or carbonate use) and report the comparison analysis of the IEFs used by member States, including the reasons for significant deviations from the average value for the European Union and from the default IPCC EFs, if such deviations occur	Yes. Comparability*
I.33	2.A.4 Other process uses of carbonates – CO_2	The ERT noted that CO_2 emissions from other process uses of carbonates is a key category (2.A.4). However, the European Union did not report information on the methodologies, assumptions, EFs and AD used to estimate CO_2 emissions from this category. During the review, the European Union provided a summary of	Yes. Transparency*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		the AD, EFs and CO_2 emissions for each member State for 1990 and 2014	
		The ERT recommends that the European Union report a summary description of the methodologies, assumptions, EFs and AD used to estimate emissions from other process uses of carbonates (2.A.4) for each member State	
I.34	2.B.1 Ammonia production – CO_2	The ERT noted that, in the European Union submission of 9 September 2016, the CO_2 IEF for ammonia production for Hungary (0.06 t CO_2/t ammonia) is significantly lower that the range of IEFs from other member States (1–2 t CO_2/t ammonia). During the review, the European Union explained that the AD for ammonia production reported by Hungary refers to the consumption of natural gas rather than ammonia produced as reported by other member States. The European Union further explained that, owing to the automatic aggregation performed by the European Union for its reporting in the CRF tables, natural gas consumption has been automatically and incorrectly added as ammonia production. Moreover, the European Union clarified that the IEFs reported in the NIR are not comparable between Hungary and other member States and that the average IEF for the European Union was estimated incorrectly	Yes. Comparability *
		The ERT recommends that the European Union correct the reporting of the AD, CO_2 emissions and CO_2 IEF for ammonia production for Hungary and recalculate the aggregated values for the European Union in the CRF tables, and correct the average CO_2 IEF for the European Union reported in the NIR	
I.35	2.B.1 Ammonia production – CO_2	The European Union reported that Czechia used a tier 1 method and country-specific EF to estimate CO_2 emissions from ammonia production (see table 4.13 of the NIR). The ERT noted that CO_2 emissions from ammonia production is a key category for Czechia. In addition, the ERT noted that Czechia used a default CO_2 EF (3.273 t CO_2/t ammonia) from the 2006 IPCC Guidelines (volume 3, chapter 3, table 3.1, p.3.15) instead of a country-specific EF as stated in the NIR. During the review, the European Union clarified that Czechia was not able to use a higher-tier method because the Czech Statistical Office only reports information on the sector where the fuel was used (i.e. chemical and petrochemical industry), and does not disaggregate for specific production outputs	Yes. Accuracy *
		The ERT recommends that the European Union work with Czechia to move from a tier 1 to a higher-tier method to estimate CO_2 emissions from ammonia production, which is a key category, in accordance with the 2006 IPCC Guidelines	
I.36	2.B.2 Nitric acid production – N_2O	The European Union reported that the AD used to estimate N_2O emissions from nitric acid production in Lithuania for 1990 and 2013 are 355 437 kt and 1 049 172 kt, respectively (see table 4.16 of the NIR). The ERT noted that the increase in nitric acid production in Lithuania would contribute to a significant increase in the average nitric acid production in the European Union. During the review, the European Union stated that the AD values reported for Lithuania were incorrect and provided the correct AD for 1990 (335.437 kt) and 2014 (1 140.746 kt)	Yes. Transparency *

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		The ERT recommends that the European Union correct the AD for nitric acid production and recalculate the N_2O IEF for Lithuania	
I.37	2.B.3 Adipic acid production – N_2O	The ERT noted that, in the European Union submission of 9 September 2016, the N_2O IEF for adipic acid production for 1990 reported in CRF table 2(I).A-H (3.25 t N_2O/t adipic acid) is significantly higher than the IPCC default EF (0.3 t N_2O/t adipic acid). During the review, the European Union explained that the IEF was calculated incorrectly, as much of the AD are confidential and it is not possible to apply gap-filling techniques. The European Union further explained that Germany, France, Italy, Poland, Romania and the United Kingdom produced adipic acid in 1990 but the four largest emitters reported the AD as confidential	Yes. Comparability*
		The ERT recommends that the European Union recalculate and report the European Union average N_2O IEF for adipic acid production, taking into account only N_2O emissions for which there are AD available and explain in the NIR the approach used to calculate the IEF	
I.38	2.B.4 Caprolactam, glyoxal and glyoxylic acid production – N_2O	The ERT noted that the annual N_2O emissions from caprolactam production in Czechia (0.25 kt N_2O) are the same throughout the whole time series. During the review, the European Union explained that, based on a study conducted at the plant, the N_2O emissions were approximately 0.25 kt N_2O, which is reported by Czechia as a constant value for the whole time series. The European Union further explained that, according to the NIR of Czechia, N_2O emissions from the production of caprolactam has been continuously measured as of 2012 as a consequence of the inclusion of caprolactam production in the scope of the EU ETS. The ERT considers that the reported N_2O emissions from caprolactam production are not accurate	Yes. Accuracy*
		The ERT recommends that the European Union work with Czechia to recalculate and report more accurate N_2O emissions from caprolactam production, taking into account the data collected under the EU ETS	
I.39	2.B.8 Petrochemical and carbon black production – CO_2	The ERT noted that CO_2 emissions from petrochemical and carbon black production is identified as a key category (see p.365 of and annex III to the NIR), but no information is provided on the methodologies, assumptions, EFs and AD used to estimate CO_2 emissions from petrochemical and carbon black production in, for example, Czechia, France, the Netherlands, Romania, Slovakia and Spain. During the review, the European Union provided the required information	Yes. Transparency*
		The ERT recommends that the European Union include information on the methodologies, assumptions, EFs and AD used to estimate CO_2 emissions from petrochemical and carbon black production, which is a key category	
I.40	2.B.8 Petrochemical and carbon black production – CO_2	The ERT noted that the IEF for ethylene production for France (0.0005 t CO_2/t ethylene) is significantly lower than the IPCC default EF (0.95–2.29 t CO_2/t ethylene). During the review, the European Union clarified that CO_2 emissions from fuel consumption in ethylene production in France were allocated to the energy sector	Yes. Comparability*
		The ERT recommends that the European Union include in the NIR the reasons why CO_2 emissions from fuel	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
		consumption in ethylene production in France were allocated to the energy sector and work with the member State to allocate CO_2 emissions from fuel use in ethylene production to the IPPU sector, under petrochemical and carbon black production, in accordance with the 2006 IPCC Guidelines	
I.41	2.B.9 Fluorochemical production – HFCs	The ERT noted that, in the submission of 9 September 2016, the European Union reported in CRF table 2(II)B-H CF_4 emissions as a by-product of HCFC-22 production (213 t CF_4 for 2013). The ERT notes that according to the 2006 IPCC Guidelines, only HFC-23 emissions are considered as a by-product of HCFC-22 production. During the review, the European Union clarified that CF_4 emissions were reported under the subcategory production of HCFC-22 (2.B.9.a.1) by Italy and that the methodology used to estimate CF_4 emissions is based on measured data of CF_4 concentration in one chemical plant. In addition, the abatement system used in the plant collects the flow gases not only from HCFC-22 production but also from the production of other chemical substances where CF_4 can also be formed. The ERT considers that it is not clear how CF_4 emissions from the production of HCFC-22 occur	Yes. Comparability*
		The ERT recommends that the European Union explain in the NIR how CF_4 emissions from the production of HCFC-22 occur and work with Italy to allocate CF_4 emissions under the subcategory fluorochemical production – by-product emissions (other) (2.B.9.a.2) instead of the subcategory fluorochemical production – by-product emissions (production of HCFC-22) (2.B.9.a.1)	
I.42	2.B.9 Fluorochemical production – HFCs and PFCs	The ERT noted that, in the submission of 9 September 2016, emissions from unspecified mix of HFCs and PFCs reported under the subcategory fluorochemical production – by-product emissions (other) (2.B.9.a.2) decreased from 5 567.08 kt in 1990 to 46.70 kt in 2013. However, a description of the methodology used and information to explain the trend was not provided in the NIR. During the review, the European Union explained that these emissions were reported by Germany and since there are less than three producers in Germany, the data are confidential	Yes. Transparency*
		The ERT recommends that the European Union provide a description of the methodology used and information explaining the trend of emissions of unspecified HFCs and PFCs reported under the subcategory fluorochemical production – by-product emissions (other) (2.B.9.a.2)	
I.43	2.C.1 Iron and steel production – CO_2	The ERT noted that Romania used a default EF (1.72 t CO_2/t steel, provided in volume 3, chapter 4, table 4.1, of the 2006 IPCC Guidelines) to estimate emissions from steel production in OHFs. The ERT further noted that CO_2 emissions from iron and steel production is a key category. The ERT also noted that the use of the IPCC default EF might include the CO_2 emissions from fuel combustion in OHFs and in pig iron production. During the review, the European Union confirmed that CO_2 emissions from fuel combustion in OHFs in Romania were estimated under the energy sector. The ERT notes that CO_2 emissions from fuel combustion in OHFs are double counted owing to the use of a tier 1 method. With regard to the risk of double counting of CO_2 emissions from pig iron production, the European Union provided no clarification	Yes. Accuracy*
		The ERT recommends that the European Union work with Romania to enable Romania to use a higher-tier	

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
		method and ensure that double counting does not occur when estimating CO_2 emissions from iron and steel production	
I.44	2.C.1 Iron and steel production – CO_2	The ERT noted that, in the submission of 9 September 2016, the European Union reported in CRF table 2(I).A-H CO_2 recovery from pig iron production in Hungary (879.62 kt CO_2 for 2014). The ERT also noted that the amount captured and reported as CO_2 recovery is used for electricity production (see p.116 of the NIR of Hungary). The ERT notes that, according to the 2006 IPCC Guidelines, the amount of CO_2 captured and used for electricity production should preferably be reported under the energy sector, not reported as CO_2 recovered under the IPPU sector, and noted that this approach was used by all member States except Hungary	Not an issue
		The ERT encourages the European Union to work with Hungary to use the notation key "NO" to report CO_2 recovery from pig iron production in Hungary and report the CO_2 captured and used for electricity production under the energy sector	
I.45	2.C.1 Iron and steel production – CO_2	The ERT noted that the European Union used the notation key "NA" to report CO_2 emissions from sinter production in Italy for 2014, while also reporting 8 358 kt of sinter production as AD for the same year (see p.409 of the NIR). During the review, the European Union clarified that sinter production in Italy is carried out at two integrated iron and steel production plants and that the emissions from sinter production are not reported separately but rather aggregated and reported under the category pig iron (2.C.1.b)	Yes. Transparency*
		The ERT recommends that the European Union use the notation key "IE", instead of "NA", when reporting on CO_2 emissions from sinter production in Italy in the NIR and specify where in the inventory these emissions are included	
I.46	2.C.1 Iron and steel production – CO_2	In the NIR, the European Union reported pig iron production in Slovakia for 1990 and 2014 of 17 kt and 24 kt, respectively (see figure 4.14, p.411 of the NIR). The ERT noted that pig iron production in Slovakia is expected to be higher, taking into account its level of CO_2 emissions from iron and steel production. During the review, the European Union explained that, according to the *Steel Statistical Yearbook 2015* of the World Steel Association, pig iron production in Slovakia for 2014 amounts to 3 838 kt. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions	Yes. Accuracy*
		The ERT recommends that the European Union work with Slovakia to correct the reported AD for total pig iron production used to estimate CO_2 emissions from iron and steel production	
I.47	2.C.3 Aluminium production – CO_2	The ERT noted that the European Union did not include in the NIR information on CO_2 emissions from aluminium production, but reported those emissions in the CRF tables	Yes. Transparency*
		The ERT recommends that the European Union include in the NIR information on the method, assumptions, EFs and AD used to estimate CO_2 emissions from aluminium production	

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue*[b] *and or a problem*[c]*? If yes, classify by type*
I.48	2.C.7 Other (metal industry) – CO_2	The ERT noted that the European Union did not include in the NIR information on CO_2 emissions reported under the subcategory metal industry – other (2.C.7), but reported those emissions in CRF table 2(I). During the review, the European Union clarified that the CO_2 emissions reported under the subcategory metal industry – other (2.C.7) include: (1) all process emissions from the non-ferrous sector (including lead and zinc) in Belgium; (2) silicium production in Spain; (3) copper and nickel smelting in Finland; emissions from one plant producing copper, lead and zinc, and one metal recycling plant mainly producing lead by melting used batteries and recovering the lead in Sweden; and (4) emissions from anode burn-off during the anode baking process (used for aluminium production) in Slovenia	Yes. Transparency*
		The ERT recommends that the European Union include in the NIR information on the sources and amount of emissions reported under the subcategory metal industry – other (2.C.7)	
I.49	2.D Non-energy products from fuels and solvents use – CO_2	The ERT noted that the European Union did not include in the NIR information on the methodologies, assumptions, EFs and AD used to estimate CO_2 emissions from non-energy products from fuel and solvent use, but reported the emissions in the CRF tables. The ERT also noted that CO_2 emissions from non-energy products from fuel and solvent use is a key category. During the review, the European Union clarified that it would include the required information in the NIR of the 2017 GHG inventory submission	Yes. Transparency*
		The ERT recommends that the European Union provide in the NIR information on the methodologies, assumptions, EFs and AD used to estimate CO_2 emissions from non-energy products from fuel and solvent use, which is a key category	
Agriculture			
A.8	3. General (agriculture) – CO_2	The ERT noted that the European Union used the notation key "IE" to report indirect CO_2 emissions from the agriculture sector in CRF table 6 for the Netherlands and Slovakia. The ERT also noted that the European Union did not provide in the NIR any indication of where in the inventory these emissions have been included. During the review, the European Union clarified that indirect emissions of CO_2 from the agriculture sector are included in the IPPU sector in the case of the Netherlands. However, in the case of Slovakia, the ERT did not find any indication in the NIR of Slovakia that indirect CO_2 emissions are estimated, and concluded that the correct notation key for reporting indirect CO_2 emissions from the agriculture sector should be "NE"	Yes. Transparency*
		The ERT recommends that the European Union indicate in the NIR where in the inventory of the Netherlands indirect CO_2 emissions from the agriculture sector are included. The ERT also recommends that the European Union work with Slovakia to use the appropriate notation key to report indirect CO_2 emissions from the agriculture sector or explain where in the inventory Slovakia has reported these emissions	
A.9	3. General (agriculture) – CH_4	The ERT noted that the NIR does not include information on the methodology and CH_4 EFs used to estimate emissions from cattle, sheep and swine for Austria, France and Iceland (see tables 5.2, 5.3, 5.13 and 5.14 of	Yes. Transparency*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		the NIR). During the review, the European Union explained that information from specific member States was missing owing to problems encountered in the new CRF Reporter software and that member States would deliver complete information for the next GHG inventory submission	
		The ERT recommends that the European Union compile and report information on the methodology and CH_4 EFs used to estimate emissions from cattle, sheep and swine for all member States	
A.10	3.A Enteric fermentation – CH_4 and N_2O	In table 5.54 of the NIR, the European Union reported the contribution of member States' recalculations to the total change in emissions from enteric fermentation, including background information on the recalculations. However, the ERT noted that no information was provided on the recalculations for France, Iceland and Luxembourg. During the review, the European Union explained that, according to the NIRs of the member States, Iceland did not perform any recalculations while the reason for the recalculation for Luxembourg was the change to the use of the 2006 IPCC Guidelines and the revision of AD. The recalculation by France corresponds to less than 0.0% of emissions and was therefore deemed insignificant	Yes. Transparency*
		The ERT recommends that the European Union include in the NIR background information on the recalculations of emissions from enteric fermentation for all member States where differences between the latest and the previous submissions occur	
A.11	3.A.1 Cattle – CH_4	In the NIR, the European Union stated that milk yield data for the Netherlands were not available (see p.451 of the NIR). However, in annex III to the NIR, the methodological description for the estimation of CH_4 emissions from dairy cattle in the Netherlands indicates that milk production per cow increased as a result of genetic changes (due to breeding programmes for milk yield) and the increase in feed intake and higher feeding quality of cattle diets, suggesting that milk yield data are available. During the review, the European Union explained that it is working with member States to ensure that the European Union submission includes correct information from member States. The European Union further explained that as the NIRs of the member States are provided to the European Union one month before the submission of the European Union, some minor inconsistencies between the 29 NIRs of the member States and the NIR of the European Union cannot be excluded. Moreover, the European Union explained that it introduced a new process in 2016 whereby the methodological tables are shared with the European Union member States during the consultation of the NIR of the European Union and revised information is taken into account to the extent possible in the final report	Yes. Transparency*
		The ERT welcomes the efforts of the European Union and its member States in implementing the new checking process for reporting methodological information and recommends that the European Union work with the Netherlands to include the Netherlands' milk yield for dairy cattle in the NIR of the European Union, as is the case for all other member States	
A.12	3.B Manure management – N_2O	The European Union used the notation key "IE" to report the contribution of the Netherlands to total N_2O emissions from manure management of cattle in the NIR (see table 5.26, p.479), without specifying where in	Yes. Comparability*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		the inventory the emissions have been included. During the review, the European Union explained that the Netherlands reported in the documentation box of CRF table 3.B(b) that data on individual animals are not available and, therefore, the total N_2O emissions from liquid systems and solid storage and dry lot in the Netherlands are reported under the subcategory other livestock (3.B.4)	
		The ERT recommends that the European Union work with the Netherlands to investigate whether N_2O emissions from manure management can be estimated and reported separately for each livestock category	
A.13	3.B Manure management – N_2O	The European Union used the notation key "NE" to report the allocation of manure from each livestock species to each manure management system (see CRF table 3.B(a)). However, the ERT noted that no explanation is provided in the documentation box of CRF table 3.B(a) and in the NIR on why the notation key "NE" is used. During the review, the European Union explained that its reporting is the aggregated sum of the member States' values and that it would consider whether the allocation of manure from each livestock species to each manure management system can be calculated and reported in future GHG inventory submissions	Yes. Transparency*
		The ERT recommends that the European Union include information on the use of the notation key "NE" to report the allocation of manure per livestock species and per manure management system and work with member States to calculate such allocations based on the data provided by member States	
A.14	3.B Manure management – N_2O	In its submission of 9 September 2016, the European Union used the notation key "IE" to report direct N_2O emissions from anaerobic lagoons (see CRF table 3.B(b)). However, no explanation is provided on where in the inventory the emissions have been included. During the review, the European Union explained that it reports the notation keys used by member States and that all member States except Spain used the notation key "NO" to report direct N_2O emissions from anaerobic lagoons. The European Union further explained that manure in Spain undergoes a concatenated process which makes it impossible to associate them with any of the definitions of manure management systems considered in the 2006 IPCC Guidelines. Therefore, direct N_2O emissions from manure management in Spain were considered under the subcategory other management systems. The issue has been addressed and Spain has included the information in the 2017 inventory submission	Yes. Transparency*
		The ERT recommends that the European Union provide information on the use of the notation key "IE" by Spain to report direct N_2O emissions from anaerobic lagoons in CRF table 3.B(b), indicating where in the inventory the emissions have been included	
A.15	3.B.1 Cattle – N_2O	The ERT noted significant inter-annual changes in the trend of the nitrogen excretion rate for non-dairy cattle for 1998/1999 (–27.3%) and 1999/2000 (37.5%) (see figure 5.49, p.490 of the NIR). However, no information is provided in the NIR to explain such inter-annual changes. During the review, the European Union explained that the excretion rate for non-dairy cattle for 1999 is an outlier because the excretion rate for France was reported as zero for 1999 owing to a technical error and that France provided correct values in	Yes. Comparability*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		its latest GHG inventory submission	
		The ERT recommends that the European Union correct the reporting of the nitrogen excretion rate for non-dairy cattle for 1999	
A.16	3.B.3 Swine – CH_4	The European Union stated in the NIR that Cyprus, Czechia, Greece, Slovakia and Slovenia use a tier 1 method and default EFs to estimate CH_4 emissions from swine manure management (see table 5.14, p.462 of the NIR). However, the ERT noted that CH_4 emissions from manure management is a key category. During the review, the European Union explained that it had already identified this issue for Cyprus and Greece during a review conducted under the framework of the European Union effort-sharing decision.[d] The European Union further explained that for Czechia and Slovakia, CH_4 emissions from manure management is not a key category and that Slovenia used a tier 2 methodology with default values for volatile solids and maximum methane producing capacity of the manure. The ERT noted that CH_4 emissions from manure management from swine for Czechia and Slovakia is a significant subcategory as it contributes, together with manure management from cattle, to more than 60% of the emissions from the key category (3.B)	Yes. Accuracy*
		The ERT recommends that the European Union work with Cyprus, Czechia, Greece and Slovakia to move to a higher-tier method to estimate CH_4 emissions from manure management from swine	
A.17	3.G Liming – CO_2	In the European Union submission of 9 September 2016, the ERT noted significant inter-annual changes in the trend of CO_2 emissions from liming in CRF table 10, including for 1990/1991 (–17.3%) and 1994/1995 (19.0%). However, no information was provided by the European Union to explain the significant inter-annual changes. During the review, the European Union explained that CO_2 emissions from liming in the European Union are explained by the trend in Czechia, Finland, Latvia, Poland and the United Kingdom, accounting for 97% of the decrease in the European Union between 1990 and 2014	Not an issue
		The ERT encourages the European Union to include in the NIR information explaining the trend of CO_2 emissions from liming	
A.18	3.I Other carbon-containing fertilizers – CO_2	In the European Union submission of 9 September 2016, the ERT noted significant inter-annual changes in the trend of CO_2 emissions from other carbon-containing fertilizers in CRF table 10, including for 1996/1997 (–36.0%) and 2003/2004 (49.7%). However, no information was provided by the European Union to explain the significant inter-annual changes. During the review, the European Union explained that the strong increase in emissions from other carbon-content fertilizers was due to an increase observed in Germany, and the European Union indicated that this will be solved in the 2018 annual submission	Yes. Transparency*
		The ERT recommends that the European Union include in the NIR information explaining the trend of CO_2 emissions from other carbon-containing fertilizers	

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and or a problem[c]? If yes, classify by type*
LULUCF			
L.12	4. General (LULUCF) – CO_2	The ERT noted that several member States used the notation key "NO" to report carbon pools where there are no changes in the type of management and where net emissions are equal to net removals and therefore deemed carbon-neutral. For example, Bulgaria, Croatia, Denmark, Estonia, France, Greece, Italy, Latvia, Lithuania, Luxembourg, Romania and Slovakia used the notation key "NO" to report carbon stock changes in mineral soils under grassland remaining grassland. The ERT considers that in this situation it is not accurate to report that the carbon pool is not occurring. Instead, the ERT considers that, where a tier 1 method is applied to assume no net change for a specific carbon pool, the use of the notation key "NA" is consistent with decision 2/CP.19 because the pool does occur, although it does not result in net emissions or removals. During the review, the European Union explained that, despite the efforts implemented to harmonize the use of notation keys among member States and despite the implementation of decision 24/CP.19, there is no common understanding on the use of the notation keys for reporting information from carbon pools, and that different interpretations seem possible. The European Union further noted that, as it occurred in the past, and was recognized in the conclusions from the 9th meeting of greenhouse gas inventory lead reviewers, further guidance on the use of notation keys could be needed, specifically for the LULUCF sector The ERT recommends that the European Union use the notation key "NA" to report carbon stock changes from carbon pools where carbon stock changes are neutral (i.e. where net emissions are equal to net removals)	Yes. Comparability*
L.13	4. General (LULUCF)	The ERT noted that no information is provided on the inventory improvement status and improvement plans in section 11.3.6 of the NIR. The ERT notes that the reporting of planned inventory improvements is a mandatory requirement under the UNFCCC Annex I inventory reporting guidelines. During the review, the European Union stated that the planned improvements were reported in chapter 10 of the NIR. However, the ERT noted that no information is reported on planned inventory improvements for the LULUCF sector or KP-LULUCF activities. Additionally, the ERT noted that some planned inventory improvements are already in progress The ERT recommends that the European Union include in the NIR information on planned inventory improvements for the LULUCF sector and KP-LULUCF activities	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines
L.14	4. General (LULUCF) – CO_2, CH_4 and N_2O	The ERT noted that the European Union provided information in the NIR on the completeness of reporting on carbon stock changes by carbon stock pool for the three most important land-use change categories for 2014 (see table 6.5 of the NIR). However, the ERT further noted that it is difficult to use the information provided in the table to assess completeness as there is no information on the carbon pools for which estimates have not been reported and the underlying reasons for the missing information. The ERT further noted that, in many cases, estimates have not been provided because the carbon stock changes are neutral (net losses are equal to net gains), but in other cases there may be a lack of completeness in the reporting. The ERT notes that it is not possible to identify whether this was the case from the information provided in table 6.5 of the	Not an issue

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
		NIR. During the review, the European Union indicated that it has previously considered the option of including additional information on the missing estimates; however, it has decided to maintain the current reporting approach owing to the number of different reasons underlying the lack of estimates. Additionally, the European Union explained that, for a more comprehensive assessment of completeness, table 6.5 should be read in combination with table 6.6, which includes summary information on the methods and carbon stock change factors used by member States to estimate CO_2 emissions and removals from different carbon pools The ERT encourages the European Union to include information in table 6.5 of the NIR that differentiates between carbon pools where carbon stock changes are neutral (i.e. net emissions are equal to net removals) and when carbon stock changes for such carbon pools are not estimated by member States	
L.15	4. General (LULUCF)	In the submission of 9 September 2016, the ERT noted that the information reported by the European Union is not consistent. Inconsistencies were found in: (1) land areas reported in CRF tables 4.1, 4.A–4.F and NIR-2 and table 11.3 of the NIR; and (2) net emissions reported in CRF table 4(KP) and table 11.5 of the NIR. In addition, inconsistencies were found between the European Union submission and the reporting by member States. For example, the European Union used the notation key "NO" to report on the change in area under forest management activity for France in CRF table NIR-2 for 2013, whereas France reported in CRF table NIR-2 a change in area of 21 586.71 kha in the same year. During the review, the European Union explained that it relies on the data provided by member States. Additionally, the European Union stated that some member States' submissions were affected by technical problems related to the CRF Reporter software, which consequently affected the European Union's submission The ERT recommends that the European Union correct the inconsistencies in the reported areas in CRF tables 4.1, 4.A–4.F and NIR-2 and table 11.3 of the NIR	Yes. Adherence to UNFCCC Annex I inventory reporting guidelines
L.16	4.A.1 Forest land remaining forest land–CO_2	In the submission of 9 September 2016, the ERT noted that 11 member States used the notation keys "NA", "NE" or "NO" to report the net carbon stock changes in deadwood for the whole time series due to the fact that these member States used a tier 1 method, which results in zero carbon changes or carbon emissions from this pool (see ID# L.12 above). The ERT further noted that Malta, which also used a tier 1 method, reported the carbon stock changes as "zero", rather than using a notation key. The ERT further noted that France reported the notation key "NO" for the period 1990–1999 using the tier 1 method from the 2006 IPCC guidelines and provided estimates for the period thereafter using a country-specific method. Lastly, the ERT noted that Luxembourg reported net carbon stock change estimates for the period 2001–2010 and "zero" or a notation key for the remainder of the time series. During the review, the European Union explained that the reporting of net carbon changes in deadwood is, overall, considered to be consistent because member States used either a tier 1 (i.e. carbon neutrality) method or a country-specific method for the whole time series. In addition, the European Union provided detailed explanations on the reasons behind the lack of quantitative estimates for the whole time series in the cases of France and Luxembourg The ERT recommends that the European Union work with Luxembourg to improve the time-series	Yes. Consistency*

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and/or a problem[c]? If yes, classify by type*
		consistency of net carbon stock changes in deadwood in forest land remaining forest land	
L.17	4.B.1 Cropland remaining cropland–CO_2	The ERT noted that France reported "zero" CO_2 emissions from cropland remaining cropland for the whole time series (see table 6.17 of the NIR). The ERT further noted that in CRF table 4.B, the gain in carbon stock changes in living biomass for France, estimated to be 1 364.77 kt C for 2013, equals the absolute value of the loss in the same year (–1 364.77 kt C), resulting in a carbon-neutral balance. During the review, the European Union explained that, owing to the lack of information on the accumulation of woody biomass in the cropland land-use category, France considers that the carbon stock gains in woody biomass in cropland remaining cropland are offset by the losses due to biomass harvest under that land-use category. The ERT notes that information on the accumulation of woody biomass can be found in the 2006 IPCC Guidelines. The further ERT notes that gains and losses of woody biomass are balanced during the cycle of planting, maturing, felling and replanting when changes in crops or management practices do not occur. However, if areas of woody crops are replaced by non-woody crops, there is a loss of living biomass. Moreover, based on FAOSTAT information, the area of vineyards in France has been steadily decreasing from 907 778 ha in 1990 to 771 530 ha in 2010, which suggests changes in crops The ERT recommends that the European Union work with France to estimate the carbon stock changes in living biomass, taking into account changes in woody biomass owing to changes in crops and management practices under cropland remaining cropland	Yes. Completeness[e]
L.18	4.B.1 Cropland remaining cropland–CO_2	The ERT noted that Romania, which represents about 6.5% of the total cropland area of the European Union, is the member State which contributes the greatest amount of CO_2 removals under the category cropland remaining cropland, contributing with removals of –3 015 kt CO_2 for 1990 and –2 899 kt CO_2 for 2014 (see table 6.17 of the NIR). However, no information is provided in the NIR to support the contribution of Romania to CO_2 emissions from cropland remaining cropland. During the review, the European Union explained that the large sink reported by Romania is due to the inclusion of areas of revegetation in the cropland land category in accordance with its national definition The ERT encourages the European Union to include in the NIR information to support the contribution of Romania to total CO_2 emissions from cropland remaining cropland in the European Union, in particular information that explains why Romania is the member State with the largest CO_2 sink under cropland remaining cropland	Not an issue
L.19	4.F Other land – CO_2	The ERT noted that some of the definitions for the categorization of other land included in the NIR (see table 6.6.28 of the NIR) do not follow the definitions included in the 2006 IPCC Guidelines. In particular, "natural grasslands not in use for agricultural purposes" in Ireland, "mineral soils on poorly productive forest land, which do not fulfil the threshold values for forest" in Finland, "standing water and canals and rivers and streams" in the United Kingdom and "shrub lands" in Portugal are defined as "other land". During the review, the European Union explained that the 2006 IPCC Guidelines state that "countries will use their own definitions of these categories". Additionally, the European Union explained that Ireland has included natural	Yes. Completeness[e]

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		grassland in unmanaged grassland; therefore, the information provided in the NIR would have to be updated for the next GHG inventory submission. Moreover, the European Union stated that member States include under 'other lands' all those areas that do not fall under any other land use category. The European Union also explained why "mineral soils on poorly productive forest lands" in Finland are reported under 'other lands' and why soil organic carbon stock increased in 'other lands' in Portugal. The ERT notes that, in accordance with the 2006 IPCC Guidelines, the land-use category other land concerns unmanaged areas which are not included in inventory estimates. However, some member States included significant carbon pools under other land remaining other land that can be subject to variations which are not reported in the CRF tables and for which there is no clear indication in the NIR that they are unmanaged areas The ERT recommends that the European Union: (1) include in the NIR information on whether land areas reported under other land in Finland, Portugal and the United Kingdom are unmanaged, and if not, to work with these member States to report these areas and the associated CO_2 emissions and removals under the appropriate land-use categories; and (2) update the information provided in the NIR regarding the definitions for the categorization of "other land" used by the member States	
L.20	4.G Harvested wood products – CO_2	In the European Union submission of 9 September 2016, the ERT noted that the annual stock change of HWP reported in CRF table 4.G under approach A (stock change approach) is not consistent with the net emissions/removals from HWP reported in the same table. The ERT also noted that no information is reported in CRF table 4.G under approach B (production approach), although it is stated in the NIR that the majority of member States used approach B to calculate emission/removal estimates for HWP (see pp.638–640 of the NIR). The ERT considers that the application of a single approach to the reporting of HWP among member States and Iceland would reduce the chance of omissions or double counting due to trade between member States. During the review, the Party confirmed the problems with the information reported in the CRF tables which do not allow for the reporting of information under approach A and approach B simultaneously. The European Union further confirmed that all member States used approach B and that information was incorrectly reported under approach A by Latvia, Lithuania and Romania The ERT recommends that the European Union correct the reporting of information on HWP in CRF table 4.G by reporting the information according to the approaches used by member States to estimate emissions/removals associated with HWP and correct the information in its NIR on approaches used by member States to estimate emissions/removals associated with HWP	Yes. Comparability*
L.21	4.G Harvested wood products – CO_2	In the European Union submission of 9 September 2016, the ERT noted that a number of member States do not report information on HWP for all or part of the time series. For example, estimates for HWP in CRF table 4.G were not provided for Cyprus for the whole time series and, for the period prior to 2000, were not provided for Belgium. During the review, the European Union explained that estimates are under preparation for Belgium and Cyprus and would be submitted when they become available. The Party also indicated that it would follow up on this issue prior to the next GHG inventory submission	Yes. Completeness*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		The ERT recommends that the European Union work with Belgium and Cyprus to ensure that the information on HWP in CRF table 4.G is complete for the whole time series	
Waste			
W.7	5.A Solid waste disposal on land – CH_4	The ERT noted that the European Union used the notation key "NA" to report information in the NIR on the methods and CH_4 EFs used by some member States to estimate emissions from solid waste disposal on land (see tables 7.2 (Austria and Cyprus) and 7.3 (for most member States) of the NIR). However, further information was not provided on the rationale for using the notation key "NA". During the review, the European Union explained that the information in the NIR reflects the information provided by the member States	Not an issue
		The ERT encourages the European Union to include in the NIR an explanation of the use of the notation key "NA" for reporting information on the methods and CH_4 EFs used by a number of member States to estimate emissions from solid waste disposal on land	
KP-LULUCF			
KL.6	General (KP-LULUCF)	In its report to facilitate the calculation of the assigned amount, the European Union stated that the information on how the national system under Article 5, paragraph 1, of the Kyoto Protocol will identify land areas associated with activities under Article 3, paragraph 4, of the Kyoto Protocol and on how member States ensure that land that was accounted for in the first commitment period continues to be accounted for in the second commitment period is provided in the individual initial reports of the member States and Iceland or in their NIRs. The European Union further stated that the development of the methodological approach to identify land areas is part of member States' responsibilities	Yes. Transparency*
		The ERT noted that the report to facilitate the calculation of the assigned amount does not contain transparent information on how member States ensure that land that was accounted for in the first commitment period continues to be accounted for in the second commitment period	
		The ERT recommends that the European Union provide summary information on how member States ensure that land that was accounted for in the first commitment period continues to be accounted for in the second commitment in its NIR	
KL.7	General (KP-LULUCF)	In the European Union submission of 9 September 2016, the ERT noted some issues relating to the accuracy and completeness of the European Union submission. For example, inconsistencies were found between different CRF tables (e.g. areas in CRF table NIR-2 and in CRF tables 4(KP)A.1 to 4(KP)B.5), between the NIR and the CRF tables (e.g. between table 11.3 of the NIR and CRF table NIR-2, and between table 11.5 of the NIR and CRF table 4(KP)), and between the values reported by the European Union and by member States (e.g. forest management activities for France were reported using the notation key "NO" in CRF table 4(KP)B.1, although quantitative data were available in the CRF tables of France). During the review, the	Yes. Transparency*

ID	Finding [description]	Recommendation [description]	Is finding an issue? and or a problem? If yes, classify by type
		European Union stated that technical issues with CRF Reporter affected the overall quality of member States' submissions and, consequently, the quality of the European Union submission as its submission relies on the data provided by member States. The European Union further stated that an error found in the aggregation process also explains some of these inconsistencies. The ERT noted that additional automated quality assurance/quality control checks may identify potential problems in the CRF tables that can be addressed prior to the Party's submission, in particular for completeness and consistency. For example, such checks may include comparisons between AD for summary and sectoral tables (e.g. CRF table NIR-2 and sectoral CRF tables 4(KP-I)A.1 to 4(KP-I)C) In those cases where the reported data were unclear, incomplete or inaccurate in the member States' submissions, the European Union was not able to provide clarifying and conclusive information during the review. For example, the Party did not provide information to clarify the inconsistency in the area between the sectoral tables (CRF tables 4.A–4.F and CRF tables 4(KP-I)A.1, 4(KP-I)A.2 and 4(KP-I)B.1–B.5) and the land matrix for the LULUCF sector and KP-LULUCF activities; the area of unmanaged forests in France; the approaches used to identify HWP from deforestation events in member States that report HWP from deforestation; or the background level of emissions from natural disturbances included in the FMRL The ERT recommends that the European Union: (1) correct the error found in its aggregation process to ensure the consistency of information of the European Union and its member States; and (2) ensure that issues identified during the aggregation process, which affect the accuracy and completeness of its submission, are resolved	
KL.8	General (KP-LULUCF) – CO_2	The ERT noted that the information reported in table 11.5 of the NIR is not consistent with that reported in CRF tables 4(KP-I)A.1, 4(KP-I)A.2 and 4(KP-I)B.1 in the submission of 9 September 2016. In particular, the European Union used the notation key "NO" to report the net carbon stock changes for France and the Netherlands in CRF tables 4(KP-I)A.1, 4(KP-I)A.2 and 4(KP-I)B.1, although quantitative information is provided in table 11.5 of the NIR. During the review, the European Union explained that these issues resulted from errors in the automatic aggregation process of information provided by member States. The Party also explained that the Netherlands faced technical difficulties when using the CRF Reporter software for its submission The ERT recommends that the European Union correct the information on afforestation/reforestation, deforestation and forest management for France and the Netherlands by providing the correct estimates in CRF tables 4(KP-I)A.1, 4(KP-I)A.2 and 4(KP-I)B.1 and ensure that the information in these tables is consistent with that reported in table 11.5 of the NIR	Yes. Completeness*
KL.9	Afforestation and reforestation – CO_2	In the European Union submission of 9 September 2016, the ERT noted that Cyprus and Malta used the notation key "NE" to report net CO_2 emissions/removals from afforestation and reforestation activities (see CRF table 4(KP-I)A.1). Additionally, Hungary used the notation key "NE" to report net CO_2 emissions/removals for the dead organic matter and soil organic carbon pools from afforestation and	Yes. Completeness*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		reforestation activities (see CRF table 4(KP-I)A.1), demonstrating that the pools do not result in net CO_2 emissions	
		The ERT recommends that the European Union work with Cyprus and Malta to estimate net CO_2 emissions/removals from afforestation and reforestation activities	
KL.10	Deforestation – CO_2	In the European Union submission of 9 September 2016, the ERT noted that Cyprus used the notation key "NE" to report net CO_2 emissions/removals from deforestation activity (see CRF table 4(KP-I)A.2)	Yes. Completeness*
		The ERT recommends that the European Union work with Cyprus to estimate net CO_2 emissions/removals from deforestation activity	
KL.11	Article 3.4 activities – CO_2	In the European Union submission of 9 September 2016, the ERT noted that the United Kingdom used the notation key "NE" to report the net carbon stock changes in the litter and deadwood pools under cropland and grazing land management (see CRF tables 4(KP-I)B.2 and 4(KP-I)B.3). The ERT further noted that the United Kingdom used the notation key "NE" to report CO_2 emissions/removals from wetland drainage and rewetting activities (see CRF table 4(KP-I)B.5)	Yes. Completeness*
		The ERT recommends that the European Union work with the United Kingdom to estimate the net carbon stock changes in the litter and deadwood pools under cropland and grazing land management and CO_2 emissions/removals from wetland drainage and rewetting activities	
KL.12	Article 3.4 activities	In the European Union submission of 9 September 2016, the ERT noted that in CRF table NIR-2, the European Union reported areas where activities under Article 3, paragraph 4, of the Kyoto Protocol occur for member States that have not elected such activities. For example, the European Union reported cropland management and grazing land management areas for Romania, whereas this member State did not elect such activities. This misallocation of areas affects the total areas for activities under Article 3, paragraph 4. During the review, the European Union stated that it was aware of the issue and that it would be corrected in close collaboration with the affected countries for its next GHG inventory submission. The ERT noted that this issue was not listed among the planned improvements included in the NIR of the European Union	Yes. Accuracy*
		The ERT recommends that the European Union ensure that the reporting under Article 3, paragraph 4, only includes the areas of those activities that were voluntary selected by the member States	
KL.13	Article 3.4 activities	... the European Union submission of 9 September 2016, the ERT noted that, in CRF table NIR-2, some member States (Denmark, Germany, Portugal and the United Kingdom) reported land-use changes from cropland management to grazing land management and vice versa. The ERT notes that, according to the Kyoto Protocol Supplement, it is good practice to establish and follow a hierarchy among the elected activities under Article 3, paragraph 4, to improve transparency and avoid double counting. During the review, the European Union explained that the countries based their reporting on the following sentence and on example 6 of the Kyoto Protocol Supplement (see pp.1.14 and 1.17, respectively): "grazing land	Not a problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		management can become cropland management and vice versa, and it is reported under the elected Article 3.4 activity most recently applied to the land"	
		The ERT encourages the European Union to work with the member States to establish and follow a hierarchy among activities under Article 3, paragraph 4, in accordance with the good practice provided in the Kyoto Protocol Supplement	
KL.14	Forest management – CO_2	The ERT noted that Cyprus and Malta used the notation key "NE" to report net CO_2 emissions/removals from forest management activities. The ERT further noted that Greece and Hungary also used the notation key "NE" to report the net carbon stock changes in the litter, deadwood and organic soils pools (see CRF table 4(KP-I)B.1 of the submission of 9 September 2016) to indicate that these pools are not included in the accounting because they do not result in net CO_2 emissions	Yes. Completeness*
		The ERT recommends that the European Union work with Cyprus and Malta to estimate net CO_2 emissions/removals from forest management activities	
KL.15	Forest management– CO_2	In the European Union submission of 9 September 2016, the ERT noted that the overall technical correction to the FMRL for the European Union has not been included in the NIR, and the information included in CRF table 4(KP-I)B.1.1 is not complete with respect to all member States and is also not accurate. For example, information on the technical correction in CRF table 4(KP-I)B.1.1 is not complete for a number of member States (Belgium, Cyprus, Czechia, Estonia, France, Germany, Iceland, Italy, Luxembourg, Malta, the Netherlands, Poland, Slovakia, Slovenia and Spain) and in some cases it is unclear from the information included in the NIR whether this is because there is no need for a technical correction for that member State, or for another reason. The value reported in CRF table 4(KP-I)B.1.1 for the value of the FMRL inscribed in decision 2/CMP.7 does not match the one provided in the appendix to the annex to decision 2/CMP.7. During the review, the European Union explained that the FMRL and the technical correction do not include information for all member States owing to problems with the automatic aggregation of information from member States. The European Union further explained that there is an error in the FMRL reported in table 11.21 of the NIR and in CRF table 4(KP-I)B.1.1 because the reported technical correction for Bulgaria represents the revised FMRL ($FMRL_{corr}$), not the value of the technical correction. The European Union further stated that owing to the incomplete information reported in the CRF tables of the member States, the FMRL reported in CRF table 4(KP-I)B.1.1 is also incorrect and does not match the FMRL inscribed in the appendix to the annex to decision 2/CMP.7. The ERT notes that changing the number of member States from 27 to 28 plus Iceland will also result in changes to the FMRL by means of technical corrections. However, the ERT noted that information on the European Union's technical correction was not provided in the NIR. During the review, the Party indicated that such information would be provided in the next GHG inventory submission. The ERT notes that KP-LULUCF accounting is to be undertaken individually by the member States and Iceland, and that the European Union will neither issue nor cancel Kyoto Protocol units based on reported KP-LULUCF emissions. However, because the European Union has an FMRL inscribed in the	Yes. Transparency*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and or a problem[c]? If yes, classify by type
		appendix to the annex to decision 2/CMP.7, and because the Party has made an annual GHG inventory submission, the ERT considers that the requirements of annex II to decision 2/CMP.8 apply to the information reported by the European Union	
		The ERT recommends that the European Union provide in the NIR and in CRF table 4(KP-I)B.1.1, as appropriate, accurate information on the value of the FMRL inscribed in decision 2/CMP.7 and the value of the technical correction for the European Union as a whole and for each of the member States plus Iceland, in accordance with the requirements of decision 2/CMP.8, annex II, paragraph 5(f) and taking into consideration the changes made in the coverage of the FMRL	
KL.16	Forest management – CO_2	The ERT noted that the European Union did not include in its annual submission information on the background level of emissions associated with annual natural disturbances that have been included in the FMRL for the European Union, in accordance with the requirements of decision 2/CMP.7, annex, paragraph 33(a)	Yes. Transparency*
		During the review, the European Union explained that in most cases the average levels of past disturbances would be included automatically in the FMRL of the individual member States through the calibration procedure. The ERT notes that the background level of disturbance emissions is a specific calculated value for which summary information may be transparently reported in the NIR. The ERT further notes that the calculation of the background level in accordance with the Kyoto Protocol Supplement will not always equal the average levels of past disturbances, and the approach described by the European Union may lead to an expectation of net credits from the application of the *natural disturbances approach*. Furthermore, the approach described by the European Union may also result an inconsistency between the FMRL and the reporting on forest management. The ERT noted that many member States have applied the approach proposed by the European Commission Joint Research Centre to calculate the FMRL. For these member States, the European Union has the opportunity to provide support to improve consistency and implement good practice, such as the tests contained in box 2.3.6 of the Kyoto Protocol Supplement	
		The ERT recommends that the European Union provide transparent information on the background level of emissions associated with natural disturbances included in its FMRL and work with member States, in particular those that apply the Joint Research Centre's approach, in order to improve consistency between the FMRL and the reporting of forest management in relation to the treatment of natural disturbances, and to calculate a technical correction where required	
KL.17	Cropland management – CO_2	In the submission of 9 September 2016, the ERT noted that the European Union used the notation key "NO" to report the area of organic soils in CRF table 4(KP-I)B.2 for Italy, while reporting a net carbon stock change in organic soils of 246.92 kt C for 2013. Likewise, an area of 10 704.36 kha of mineral soils is reported for Italy for 2014, while the net carbon stock change in mineral soils is reported using the notation key "NO". During the review, the European Union explained that emissions from organic soils were incorrectly reported and that it would correct this problem in its next GHG inventory submission and confirmed that the reporting	Yes. Accuracy*

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[b] and/or a problem[c]? If yes, classify by type
		of net carbon stock changes in organic soils is correct and that "NO" is the correct notation key for reporting the net carbon stock changes in mineral soils The ERT recommends that the European Union correct the reporting of the area of mineral and organic soils for Italy in CRF table 4(KP-I)B.2	
KL.18	Revegetation	The ERT noted that the European Union reported in CRF table 4(KP-I)B.4 of the submission of 9 September 2016 an area of 256 838 598 666 677 kha of mineral soils under revegetation activity in Iceland. During the review, the European Union explained that the area was incorrectly reported and that the correct area was 256.84 kha The ERT recommends that the European Union correct the reporting of the area of mineral soils under revegetation activity in Iceland in CRF table 4(KP-I)B.4	Yes. Accuracy*
KL.19	Harvested wood products – CO_2	The ERT noted that Belgium used the notation key "NE" to report net CO_2 emissions/removals from HWP for the years prior to 2000 (see CRF table 4(KP-I)C of the submission of 9 September 2016) The ERT recommends that the European Union work with Belgium to estimate net CO_2 emissions/removals from HWP	Yes. Completeness*
KL.20	Harvested wood products – CO_2	The ERT noted that a number of member States reported HWP from deforestation lands in CRF table 4(KP-I)C of the submission of 9 September 2016. The ERT notes that these HWP may be derived from trees regrown on previously deforested lands in accordance with the land classification hierarchy. The ERT further notes that any HWP originating from deforestation events should be reported using instantaneous oxidation consistent with decision 2/CMP.8, annex II, paragraph 2(g)(v). The ERT noted that most member States report aggregated HWP under forest management due to the lack of information to disaggregate HWP originating from different activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management. Further, a number of member States reported annual deforestation occurring on afforestation/reforestation and forest management lands in CRF table NIR-2. This suggests that HWP statistics for afforestation/reforestation and forest management lands may include HWP from deforestation events occurring on those lands. In particular, a number of member States have reported deforestation occurring on afforestation/reforestation and forest management lands or reported HWP from deforestation lands, but did not provide information on the amount of harvest originating from deforestation events in CRF table 4(KP-I)C. During the review, the Party explained that most member States stated that HWP from deforestation are not estimated and, consequently, are not included in the accounting in CRF table 4(KP-I)C and, therefore, HWP are accounted for on the basis of instantaneous oxidation. The ERT considers that this is not a sufficient explanation to transparently demonstrate that HWP from deforestation events are not included in aggregate HWP AD. The European Union further explained during the review that there were only a few cases where explicit information was provided by the member States that reported HWP from regrowth on deforestation lands and how these HWP are distinguished from HWP from deforestation events. The	Yes. Accuracy*

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[b] and or a problem[c]? If yes, classify by type*
		European Union also explained that, owing to the complexity introduced by the decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on KP-LULUCF activities, the reporting of HWP by member States needs to be enhanced The ERT recommends that the Party work with member States to ensure that HWP from deforestation events are accounted for on the basis of instantaneous oxidation and report explicit information regarding HWP from deforestation events in CRF table 4(KP-I)C, in accordance with good practice requirements in the Kyoto Protocol Supplement (p.2.119)	

Abbreviations: AD = activity data, CPR = commitment period reserve, CRF = common reporting format, EF = emission factor, ERT = expert review team, EU ETS = European Union Emissions Trading System, FAOSTAT = statistical database of the Food and Agriculture Organization of the United Nations, FMRL = forest management reference level, GHG = greenhouse gas, HWP = harvested wood products, IE = included elsewhere, IEF = implied emission factor, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, Kyoto Protocol Supplement = *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated, NEU = non-energy use, NIR = national inventory report, NO = not occurring, OHF = open hearth furnace, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] The review of the 2015 GHG annual submission is being held in conjunction with the review of the 2016 annual submission, in accordance with decision 10/CMP.11, paragraph 1. The ERT has reviewed both the 2015 and the 2016 inventory submission, and in accordance with the conclusions from the 13th meeting of greenhouse gas inventory lead reviewers (para. 9) it has started with the review of the 2016 submission. This table includes all findings that are relevant for both the 2015 and the 2016 annual submission (i.e. this table excludes findings that, although they may have been relevant for the 2015 annual submission, had already been resolved in the 2016 annual submission).

[b] Recommendations are related to issues as defined in decision 13/CP.20, annex, paragraph 81, or problems as identified in decision 22/CMP.1, annex, paragraph 69, identified by the ERT during the review. Encouragements are made to the Party to address all findings not related to such issues.

[c] An asterisk is included next to each issue type that is also a problem, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[d] Decision No. 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

VI. Application of adjustments

11. The ERT has not identified the need to apply any adjustments to the 2015 annual submission of the European Union.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. The European Union stated in its NIR (chapter 12, p.776) that member States will account individually for net emissions and removals for each activity under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by issuing removal units (RMUs) or by cancelling assigned amount units, emission reduction units, certified emission reductions, and/or RMUs based on the corresponding reported emissions and removals from these activities in the national registry of each member State and Iceland. The European Union will neither issue nor cancel units based on the reported emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The European Union further stated that it will report the sum of the cumulative accounting quantities of member States and Iceland for these activities at the end of the second commitment period.

13. The European Union member States and Iceland have different accounting frequencies: in particular, Hungary has annual accounting for afforestation/reforestation, deforestation and forest management, and Denmark has annual accounting for afforestation/reforestation, deforestation, forest management, cropland management and grazing land management, whereas all other member States and Iceland have commitment period accounting for their activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

VIII. Questions of implementation

14. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for the European Union for submission year 2015 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

1. Tables 6–9 provide an overview of total greenhouse gas emissions and removals, as submitted by the European Union.

Table 6

Total greenhouse gas emissions for the European Union, base year[a]–2013[b]

(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–315 476
Base year	5 636 579.29	5 863 599.20	5 643 112.30	5 870 132.21	5 560.49		53 918.84	
1990	5 421 801.70	5 661 550.61	5 428 334.71	5 668 083.62				
1995	5 041 341.76	5 310 460.98	5 046 895.10	5 316 014.32				
2000	4 861 940.25	5 166 115.09	4 866 459.00	5 170 633.84				
2010	4 470 174.91	4 780 021.64	4 473 227.38	4 783 074.12				
2011	4 316 397.43	4 625 056.21	4 319 427.55	4 628 086.32				
2012	4 254 178.22	4 558 172.14	4 257 075.05	4 561 068.96				
2013	4 158 258.06	4 467 104.04	4 161 020.09	4 469 866.06		–17 432.53	53 301.46	–428 153.14

Abbreviations: CM = cropland management, FM = forest management, FMRL = forest management reference level, GHG = greenhouse gas, GM = grazing land management, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, RV = revegetation, WDR = wetland drainage and rewetting.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O for all member States except Bulgaria (1988) Hungary (1985–1987), Poland (1988), Romania (1989) and Slovenia (1986), and 1995 for HFCs, PFCs and SF_6 for all member States except Austria, Croatia, France, Italy, Malta and Slovakia (1990) and Romania (1989), and Iceland (1990), and 1995 for NF_3 for all member States except Austria, Croatia, Greece, Poland, Portugal, Romania and Slovakia (2000). For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported. The European Union has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol because these activities are elected by each member State and Iceland. The values reported refer to the sum of the cumulative accounting quantities of member States and Iceland for these activities and are for information purposes only.

[b] Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[c] The Party has reported indirect CO_2 emissions in common reporting format table 6.

[d] The value reported in this column refers to 1990.

[e] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. The European Union has not elected any activities under Article 3, paragraph 3, of the Kyoto Protocol because these activities are elected by each member State and Iceland. The values reported represent the sum of the cumulative accounting quantities of member States and Iceland for these activities and are for information purposes only.

Table 7

Greenhouse gas emissions by gas for the European Union, excluding land use, land-use change and forestry, 1990–2013[a]

(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	4 473 622.22	735 517.25	387 303.79	29 125.64	25 864.43	5 705.72	10 920.80	23.78
1995	4 214 907.54	669 624.33	349 811.68	43 763.92	16 875.03	5 773.25	15 215.09	43.48
2000	4 175 112.19	610 182.50	307 785.37	52 862.41	11 951.34	2 077.74	10 546.47	115.81
2010	3 942 663.23	483 812.64	242 316.07	103 392.94	4 037.41	366.27	6 366.11	119.45
2011	3 799 012.64	474 131.06	238 143.25	105 957.74	4 309.35	176.68	6 228.38	127.22
2012	3 737 836.85	468 772.21	235 072.08	109 030.19	3 784.84	182.08	6 297.57	93.13
2013	3 655 316.86	456 911.60	235 764.33	111 383.37	4 038.61	193.40	6 189.40	68.49
Per cent change 1990–2013	**–18.3**	**–37.9**	**–39.1**	**282.4**	**–84.4**	**–96.6**	**–43.3**	**188.1**

[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.

[b] CO_2 emissions include indirect CO_2 emissions reported in common reporting format table 6.

Table 8
Greenhouse gas emissions by sector for the European Union, 1990–2013[a, b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	4 358 789.41	518 137.87	546 488.66	–239 748.91	244 667.68	NO
1995	4 092 592.04	497 360.69	475 490.47	–269 119.22	250 571.12	NO
2000	4 019 817.38	451 799.74	460 858.59	–304 174.83	238 158.12	NO
2010	3 797 828.78	392 511.10	423 592.99	–309 846.74	169 141.25	NO
2011	3 651 559.09	388 824.55	424 260.96	–308 658.78	163 441.72	NO
2012	3 605 265.54	376 320.78	421 373.24	–303 993.91	158 109.40	NO
2013	3 520 413.76	374 353.96	424 906.16	–308 845.97	150 192.18	NO
Per cent change 1990–2013	**–19.2**	**–27.8**	**–22.2**	**28.8**	**–38.6**	**NA**

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.
[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.
[b] Totals include indirect CO_2 emissions reported in common reporting format table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a] [b]–2013, for the European Union

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				–315 476.00				
Technical correction				19 340.91				
Base year	5 560.49				20 740.73	35 258.57	–2 080.46	NE
2013		–56 113.77	38 681.24	–428 153.14	29 171.88	25 889.87	–1 760.29	NE
Per cent change base year–2013					**40.7**	**–26.6**	**–15.4**	**NA**

Abbreviations: FMRL = forest management reference level, NA = not applicable, NE = not estimated.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O for all member States except Bulgaria (1988), Hungary (1985–1987), Poland (1988), Romania (1989) and Slovenia (1986), and 1995 for HFCs, PFCs and SF_6 for all member States except Austria, Croatia, France Italy, Malta and Slovakia (1990) and Romania (1989), and Iceland (1990), and 1995 for NF_3 for all member States except Austria, Croatia, Greece, Poland, Portugal, Romania and Slovakia (2000). For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported. The European Union has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol because these activities are elected by each member State and Iceland. The values reported refer to the sum of the cumulative accounting quantities of member States and Iceland for these activities and are for information purposes only.

[b] Values in this table include emissions on lands subject to natural disturbances, if applicable.

[c] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for the European Union's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for the European Union under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: commitment period accounting for Iceland and all member States, except Denmark and Hungary (b) Deforestation: commitment period accounting for Iceland and all member States, except Denmark and Hungary (c) Forest management: commitment period accounting for Iceland and all member States, except Denmark and Hungary (d) Cropland management: elected by Denmark, Germany, Ireland, Italy, Portugal, Spain and the United Kingdom of Great Britain and Northern Ireland with commitment period accounting for all indicated member States, except Denmark (e) Grazing land management: elected by Denmark, Germany, Ireland, Italy, Portugal and the United Kingdom with commitment period accounting for all indicated member States, except Denmark (f) Revegetation: elected by Romania and Iceland with commitment period accounting for both Parties (g) Wetland drainage and rewetting: elected by the United Kingdom with commitment period accounting
Election of activities under Article 3, paragraph 4	(a) Cropland management: elected by Denmark, Germany, Ireland, Italy, Portugal, Spain and the United Kingdom (b) Grazing land management: elected by Denmark, Germany, Ireland, Italy, Portugal and the United Kingdom (c) Revegetation: elected by Romania and Iceland (d) Wetland drainage and rewetting: elected by the United Kingdom
Election of application of provisions for natural disturbances	(a) Afforestation/reforestation: elected by Bulgaria, Croatia, France, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Romania, Spain, Sweden and the United Kingdom (b) Forest management: elected by Austria, Belgium, Bulgaria, Croatia, Cyprus, Estonia, Finland, France, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Romania, Spain, Sweden and the United Kingdom
3.5% of total base year GHG emissions, excluding LULUCF, and including indirect CO_2 emissions	205 454 627 kt CO_2 eq (1 643 637 017 kt CO_2 eq for the dur .tion of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:[a]	
1. Afforestation and reforestation in 2013	NA
2. Deforestation in 2013	NA
3. Forest management in 2013	NA

Key parameters	*Values*
4. Cropland management in 2013	NA
5. Grazing land management in 2013	NA
6. Revegetation in 2013	NA
7. Wetland drainage and rewetting in 2013	NA

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction unit, ERU = emission reduction unit, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, RMU = removal unit.

[a] The European Union has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol because these activities are elected by each member State and Iceland.

Annex II

Information to be included in the compilation and accounting database

Tables 11 and 12 include the information to be included in the compilation and accounting database for the European Union. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2013, including the commitment period reserve, for the European Union
(t CO_2 eq)

	Original submission[a]	*Revised estimates*	*Adjustment*[b]	*Final*[c]
Commitment period reserve	21 777 272 968	14 231 780 406		14 231 780 406
Annex A emissions for 2013				
CO_2[d]	3 656 503 534	3 655 316 859		3 655 316 859
CH_4	459 448 815	456 911 601		456 911 601
N_2O	237 863 508	235 764 331		235 764 331
HFCs	110 667 165	111 383 366		111 383 366
PFCs	4 027 278	4 038 611		4 038 611
Unspecified mix of HFCs and PFCs	193 404			193 404
SF_6	6 209 539	6 189 395		6 189 395
NF_3	68 493			68 493
Total Annex A sources	**4 474 981 736**	**4 469 866 061**		**4 469 866 061**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–46 367 110	–56 113 767		–56 113 767
3.3 Deforestation	27 783 892	38 681 238		38 681 238
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management for 2013	–363 558 176	–428 153 135		–428 153 135
3.4 Cropland management for 2013	29 301 018	29 171 881		29 171 881
3.4 Cropland management for the base year	21 052 076	20 740 732		20 740 732
3.4 Grazing land management for 2013	25 898 021	25 889 869		25 889 869
3.4 Grazing land management for the base year	35 313 113	35 258 569		35 258 569
3.4 Revegetation for 2013	–1 760 290			–1 760 290
3.4 Revegetation in the base year	–2 080 459			–2 080 459
3.4 Wetland drainage and rewetting for 2013	NE	NE		NE
3.4 Wetland drainage and rewetting in the base year	NE	NE		NE

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NE = not estimated.

[a] The values used in the table are those reported in the common reporting format tables (version 4), submitted on 9 September 2016.

[b] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

[c] "Final" includes revised estimates, if any, and/or adjustments, if any.

[d] CO_2 emissions include indirect CO_2 emissions reported in common reporting format table 6.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* were reported as "NE" (not estimated) or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) Carbon dioxide (CO_2) emissions/removals in mandatory categories in the land use, land-use change and forestry sector (see L.1 and L.2 in table 3);

(b) CO_2 emissions/removals from land converted to cropland (see L.7 in table 3);

(c) CO_2 emissions/removals from living biomass for France (see L.17 in table 5);

(d) CO_2 emissions/removals from other land areas for Finland, Portugal and the United Kingdom of Great Britain and Northern Ireland if such areas are deemed managed areas (see L.19 in table 5);

(e) CO_2 emissions from harvested wood products for Belgium and Cyprus (see L.21 in table 5);

(f) CO_2 emissions/removals from forest management (see KL.5 in table 3);

(g) CO_2 emissions/removals from afforestation/reforestation, deforestation and forest management for France and the Netherlands (see KL.8 in table 5);

(h) CO_2 emissions/removals from afforestation and reforestation activities for Cyprus and Malta (see KL.9 in table 5);

(i) CO_2 emissions/removals from deforestation activity for Cyprus (see KL.10 in table 5);

(j) CO_2 emissions/removals from carbon stock changes in the litter and deadwood pools under cropland and grazing land management and CO_2 emissions/removals from wetland drainage and rewetting activities for the United Kingdom (see KL.11 in table 5);

(k) CO_2 emissions/removals from forest management activities for Cyprus and Malta (see KL.14 in table 5);

(l) CO_2 emissions/removals from harvested wood products for Belgium (see KL.19 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

Annual status report for the European Union for 2016. Available at <http://unfccc.int/resource/docs/2016/asr/eu.pdf>.

FCCC/ARR/2014/EU. Report on the individual review of the annual submission of the European Union submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/eu.pdf>.

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B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Ana Danila (European Commission, Directorate-General for Climate Action), Mr. Ricardo Fernandez (European Environment Agency) and Ms. Spyridoula Ntemiri (European Environment Agency), including additional material on the methodology and assumptions used.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
C	carbon
CER	certified emission reduction
CF_4	perfluoromethane
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
FAOSTAT	statistical database of the Food and Agriculture Organization of the United Nations
FM	forest management
FMRL	forest management reference level
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs, unspecified mix of HFCs and PFCs, SF_6 and NF_3, without GHG emissions and removals from LULUCF
GM	grazing land management
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
N	nitrogen
NA	not applicable
NE	not estimated
NEU	non-energy use
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
OHF	open hearth furnace
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
UNFCCC	United Nations Framework Convention on Climate Change
WDR	wetland drainage and rewetting